THE IRON TRADE REVIEW

VOLUME XXXIX CLEVELAND, SEPTEMBER 27, 1906 NUMBER 39

CRUDE STEEL

SHIPPED HUNDREDS OF MILES TO CONSUMERS,

And Demand is Tremendous.—Heavy Buying of Cars.—Pig Iron Quiet but Firm.—Large Ore Shipments.

The wonderful prosperity of the iron and steel industries is shown in a most impressive manner by the increasing difficulty of obtaining adequate supplies of semi-finished material to meet the unprecedented requirements of the mills. Keen observers of tendencies in the trade foresaw this demand to some extent as evidenced by the building of the new Bessemer plant at Youngstown, but the addition of new capacity has furnished small relief, and there are now numerous new projects on foot to increase the supply of crude steel. During the past week the Union Pacific railroad has been unable to place an order in the Chicago market for 11,500 tons of billets for its mill at Laramie, Wyo., while many other inquiries have met with similar fate and forging billets have been shipped very long distances. Consumers have not been unwilling to pay heavy freight in order to keep their mills in operation. This tremendous demand for crude steel is due to pressure for delivery on contracts and also to the large number of orders in prospect.

Heavy Car Orders. The buying by railroads continues to be a prominent feature and several hundred thousand tons of plates will be required for the construction of rolling stock just ordered, including 12,400 cars for the Pennsylvania railroad, and 17,000 cars for the New York Central system. The buying of steel rails has not been so brisk, but the New York Central system has allotted 80,000 tons sold some weeks ago. Many rumors are current of orders for lake vessels to be placed.

There is considerable activity in the pig iron market in some centers, but very heavy buying can hardly be expected for the present. Some very high prices are being paid for prompt delivery, but quotations for the first quarter and the first half of the year are about the same as they have been for several weeks. The disposition of furnaces, both north and south, to urge buyers to cover for the first half of 1907, instead of for the first quarter only, is more noticeable. Reports to the Eastern Pig Iron Association show that furnaces in its territory have orders to cover their product for at least five months, and it is estimated that 60 per cent of the iron which can be manufactured in the middle west for delivery during the first half of next year has been sold.

Advance of Wire Prices. An advance of $1.00 per ton on all wire products has naturally followed the tremendous demand of the past three months. The principal producer has a greater tonnage on his books than ever before, and independents are well supplied with orders. The largest contract yet received for the rebuilding of San Francisco developed this week in an order for 5,000 tons of structural material for the rebuilding of the Palace Hotel. Railroads have added a considerable tonnage to their orders of bridge material. Among the important contracts let was the one for the substructure of the Pennsylvania terminal at New York.

Heavy Ore Shipments. The shipping of iron ore has progressed rapidly during the past ten days, and indications now are that the total shipments for the year will be about 36,500,000 tons. The ports at the head of the lakes have made heavy gains recently, compared with last year.

Coke and Old Material. Some important deals in coke are pending. The market is strong, and car shortage is interfering with delivery of the product. The sparring between buyers and sellers of old material continues. While in Pittsburg, buyers seem to have the advantage, the reverse is true in other centers.

MACHINERY MEN IN CONVENTION.

(Special Telegram.)

Detroit, Mich., Sept. 26.—The machinery end of the National Supply and Machinery Dealers' Association was well represented when the special meeting was called to order this morning by President Strong, of Strong, Carlisle & Hammond, Cleveland, at the Hotel Cadillac. The much discussed question of holding joint meetings has apparently been satisfactorily settled as the result of joint sessions Monday and Tuesday of the executive committees of the three organizations concerned, the National Supply and Machinery Dealers' Association, the Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association. The national association has extended an invitation to the others to meet in the same city and at the same time that its next convention is held and practical assurances are given that the invitation will be accepted. Some southern city will be settled upon. President J. A. Reichman, of Memphis, represented the southern supply men.

LATE NEW YORK NEWS.

(Special Telegram.)

New York, Sept. 26.—The United States Steel Corporation is pushing every plant for production and is being pushed by consumers for shipment.

The United States Steel Products Export Co. is holding its place in the trade, but every foreign shipment is grudged by domestic producers.

The purchase of iron ore lands in Texas by C. M. Schwab is denied officially.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Market Throughout Strong. — Pig Iron More Active.—Wire Advanced.

Office of THE IRON TRADE REVIEW, 521 PARK BUILDING, Sept. 26

The same strength of the past six weeks continued throughout the week under review, pig iron for prompt delivery being more active and several transactions involving only fairly large tonnages were put through. The point of the greatest pressure is with the finishing mills in securing steel for their requirements and in making deliveries. Specifications against existing obligations are very heavy in nearly all the finished lines and it is next to impossible to secure semi-finished steel on new contracts and very difficult to get this material already ordered, billet and bar mills being very far behind and holding out inducements to modify specifications for shipment.

Wire products have advanced $1 per ton, the advance going into effect last Thursday. A surprisingly large tonnage of nails and fence wire has been placed with the manufacturers and mills in this district have already practically filled up to capacity for the next 60 days, business being taken for that period ahead, only. On account of the pressure on their finishing mills, the makers of wire products are not quoting on rods, as in other finished lines mills are refusing to take on new business for semi-finished material except on contracts and where requirements of old customers make it necessary as a matter of accommodation to provide for them.

The immense amount of new business being taken on by the steel car manufacturers has loaded up the plate mills for a long time ahead and deliveries are being extended whenever possible in order to accommodate the rush. The New York Central lines are placing large contracts for rolling stock, the Pennsylvania lines have already contracted for 12,500 cars and the western lines are out with big inquiries. The new steel and merchant bar business is very heavy and there has been a marked improvement in the hoop market. The largest producers of steel bars have not advanced their prices, and are still holding at 1.50c, base, Pittsburg, although several of the smaller producers are quoting 1.60c, Pittsburg, on all deliveries and in one or two instances $4 to $6 premiums are being asked for prompt deliveries.

Pig Iron. — On Bessemer and basic iron there has been little or no inquiry for next year delivery, consumers having practically filled for their requirements, and at the same time furnaces have little or no iron for that delivery which they are inclined to sell at this time. For delivery during the remainder of this year 3,000 tons of Bessemer was sold during the past week at $19, valley furnace and 1,000 tons of malleable sold at $19.75, valley. There has been considerable inquiry for northern foundry iron for last quarter and this is being held close to $20, valley and as high as $20.50 has been paid. Several tonnages of southern No. 2 for prompt shipment have been sold on the basis of $16.50, Birmingham, equal to $21.10, delivered Pittsburg, but all business is being taken subject to furnace confirmation. For shipment during the remainder of the year $16 Birmingham is asked and for first half of next year $15.50. The big buyers in nearly all grades of pig iron are pretty well covered, but there is plenty of small business going. We quote as follows on first quarter pig iron:

Bessemer Valley	18.25 to 18.50
Bessemer, Pittsburg	19.10 to 19.35
No. 1 Foundry, Pittsburg	19.60 to 19.85
No. 2 Foundry, Pittsburg	19.10 to 19.35
Gray Forge, Pittsburg	18.00 to 18.35
Basic, Valley	18.25 to 18.50
Basic, Pittsburg	19.10 to 19.35

Steel. — The improvement in the supply of semi-finished steel has been very slight indeed, if it is noticeable at all, on account of the tremendous pressure on the finishing mills at this time. An appreciation of conditions is shown by the fact that nearly all the new projects being contemplated or under construction, have in view a betterment of the supply of semi-finished steel. The leading producers of billets, slabs, sheet and tin bars in this district are practically out of the market for the remainder of the year and the coming in of the new Bessemer plant of the Youngstown Sheet & Tube Co., with its tonnage last month was scarcely noticeable, so great was the demand for the material. The new No. 4 open-hearth plant of the Carnegie Steel Co., at Homestead is completed and in operation, the last furnace being lighted last week. The monthly capacity of this plant will be 35,000 tons when in full operation. We quote Bessemer soft billets $28 to $28.50 and open-hearth billets $29 to $29.50. Bessemer sheet bars are quoted $29 to $30.

Ferro-Manganese. — On ferro-manganese, foreign 80 per cent, we quote $86 to $87, Pittsburg, for prompt delivery and $83 for delivery over the remainder of the year. Ferro-silicon, 50 per cent, is quoted $97 for the remainder of the year and twelve per cent $32.50 to $33.

Skelp. — With the comparatively light demand for skelp we quote as follows:

Bessemer, grooved, 1.62½c to 1.67½c; sheared, 1.67½c to 1.72½c; basic, grooved, 1.65c to 1.70c; sheared, 1.70c to 1.75c; iron skelp, grooved, 1.80c to 1.85c; sheared, 1.90c to 2c.

Muck Bar.—With practically no new inquiry for muck bar and but very little offered for sale we quote a nominal market at $31.50, Pittsburg.

Hoops and Bands.—The strength shown by the hoop market at this time, with the regular contracting period some time off has been something of a surprise and the new business being placed is very satisfactory from a mill standpoint. There have been no concessions in price, the 1.90c base being strongly maintained. We quote as follows:

Hoops, 1.90c in carload lots, and 2c on less than carload lots; bands, 1.50c base, half extras as per standard steel card. Prices f. o. b. Pittsburg.

Structural Material.—The demand for tonnage on new contracts is not especially heavy, but with specifications coming in in fair volume the mills are still behind, although they are not losing ground and deliveries are now from eight to nine weeks. The Jobson-Hooker Co., Pittsburg, has secured a large contract for the substructure of the Pennsylvania terminal at New York and the McClintic-Marshall Construction Co., Pittsburg Construction Co., Riter-Conley Co. and the Eichleay Jr. Co., together with the American Bridge Co., have all secured some nice business during the past few weeks. There has been no change in mill prices on shapes. We quote:

Beams and channels, 15-inch, and under, 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles from three to six inches, inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Rails and Track Material.—With no more mill capacity for 1906 deliveries, the business for next year has been dragging for the past two or three weeks, there seemingly being no inclin-

ation on the part of railroads to rush in placing for their requirements. The new inquiry has been fair on standard sections but the actual contracts have been light. There has been a large tonnage of light rails placed and the demand for spikes, both iron and steel, is tremendous, the leading makers not being in position to make any promises before March or April. We quote:

Fifty pounds and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 16 pounds, $31; 20 pounds, $32; 25 to 45 pounds, $30 to $31; angle bars for standard sections, 1.50c; spikes, $2.30 to $2.35.

Steel Bars.—The volume of new business and heavy specifications against existing contracts continues unabated and during the past week a considerable tonnage has been refused on account of terms of delivery. The leading interest and largest independent maker are still holding to the 1.50c base notwithstanding the advance to 1.60c Pittsburg made by several producers. Requests for concessions have been flatly refused although some handsome business has been offered by consumers on this basis. Deliveries on new business now extend well into next year, there being nothing to offer before that time except at fancy premiums. We quote:

Cold rolled and ground shafting, 50 per cent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c to 1.80c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.05c to 2.10c. The price of planished and machine straightened tire is 1.70c base half extras as below. Iron finished tire up to 1½ inch by ½ inch, 1.65c base half extra tire list. Iron finished tire 1½ inch by ½ inch and over to be sold on regular bar basis of 1.50c base, half extra steel card.

Plates.—The steel car companies are the largest factors in the plate market at this time and they have placed contracts for an enormous tonnage extending well through the first half of next year. The Pennsylvania lines during the past week have contracted for 12,400 cars, dividing the business between the Pressed Steel Car Co., Standard Steel Car Co., American Car & Foundry Co., and Cambria Steel Co. The New York Central lines will close for a large number of cars during the present week and western lines are also out with large inquiries. Plate mills have business ahead, either actually on the books or in sight, to keep them busy for the next six months and it is almost impossible to place prompt delivery business. The demand for plates from lake ship builders is also heavy, but this is on old contracts, the ship yards having contracted practically to capacity for 1907 delivery. We quote:

Tank plate ¼ inch thick, 6¼ to 100 inches, 1.60c f. o. b. mill, Pittsburg. Light plate schedule, No. 10, 1.70c; Nos. 11-12, 1.75c; Nos. 13-14, 1.80c; Nos. 15-16, 1.90c. Extras on the regular plate schedule are as follows per 100 pounds, boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates, varying not more than four inches, in width at ends, narrowest end not being less than less than 30 inches, 0.10c; complete circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1.00c. Gauges under ¼ inch to and including 3-16 inch plates on thin edges, 0.10c; under 3-16 inch to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Merchant Bars.—Although the railroad buying of iron bars has not been up to the tonnage of the preceding week, there has been a strong demand for merchant bars. Mills are far behind on common bars and are quoting 1.60c Pittsburg. We quote:

Common iron bars, 1.60c, Pittsburg, in carload lots, 1.65c in less than carloads; Bessemer steel bars, 1.50c; plow and cultivator, 1.50c net; channels, angles, zees and tees, under three inches, 1.60c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds, of a size, 0.30c advance.

Merchant Pipe.—Conditions in the pipe market are very satisfactory to the maker from a tonnage standpoint and to the consumer and jobber from the price standpoint and the volume of business continues although deliveries are getting worse on account of the tonnage placed within the past six weeks or two months. The consumers' extreme carload discount is 80 per cent and jobbers' extreme discount for stock is 81 and 5. We quote the following official discounts, consumers' carloads, with jobbers' discounts one point higher:

	Steel		Iron	
Consumer's Carloads	Black	Galv.	Black	Galv
⅛ and ¼ inch	71	55	67½	51½
⅜ inch	73	59	69½	55½
½ inch	75	63	71½	59½
⅝ to 6 inches	79	69	76	68
7 to 12 inches	74	59	71	55½
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	64	52	60½	48½
½ to 4 inches	71	59	67½	56½
4½ to 8 inches	67	55	63½	51½
Double extra strong plain ends, ¼ to 8 inches	60	49	56½	45½

Wire and Wire Nails. — Effective Sept. 20, wire products were advanced $1 per ton. Jobbers in this district have fair stocks, but mill stocks, at this time of the year fairly large, amount to practically nothing. The new business placed for delivery during the next 60 days has been very heavy and trade conditions are better than they have been for a long time. We quote as follows:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90, and less than carload lots, $2; painted barb wire, $2 for jobbers in carloads; retailers in carloads, $2.05, and less than carloads, $2.15, with 30c for galvanizing; plain wire, $1.70 to jobbers and $1.75 by carload.

Old Material. — Two of the large consumers of scrap in the Pittsburg district are about ready to contract for a considerable tonnage and to all appearances they have won their point in holding out against the high prices asked by dealers during the past six weeks, and it is thought they will be able to obtain their heavy melting scrap at about $16.75. We quote as follows:

Heavy melting stock $16.75 to $17; No. 1 cast scrap, $16 to $16.50; cast borings, $10 to $10.50; bundled sheet scrap, $14 to $14.50; malleable scrap, 15.50 to $16; railroad wrought scrap, $19.50 to $20; low phosphorus scrap, $20 to $20.50; wrought turnings, $12 to $12.50; busheling scrap, $15.50 to $16; iron axles, $29; old rails, rerollers, $19 to $19.50.

Coke.—As announced a month ago, there has been considerable business done for next year delivery, and there are several important negotiations on at the present time with good prospects of their being closed before the end of the week. The Frick Coke Co. and the Republic Iron & Steel Co. are among the large companies figuring on prices for next year's supply. The significance of the Frick company inquiry can only be surmised. A car shortage as well as labor scarcity is affecting production. For prompt shipment we quote furnace coke $2.75 to $2.80, ovens, and foundry coke $2.60 to $2.75. For next year, foundry coke is quoted $3.50 to $3.60. The Connellsville *Courier's* detailed report of the operation and output of the Connellsville region for the week ending on Saturday, September 15, shows a total of 23,358

ovens, of which 21,809 were active and 1,549 were idle. The total estimated production was 278,227 tons, a slight gain compared with the production of the previous week.

In the lower Connellsville region there are 8,889 ovens, of which 8,625 are active and 264 are idle. The total estimated production last week was 109,510 tons, not quite as heavy as the week before.

Sheets. — The new sheet business has been very gratifying. The leading interest is pretty well sold up through the first quarter of next year, while the independent interests, who do not make a practice of contracting that far ahead, have plenty of business to the first of the year. Those not having their own steel supply are a bit reluctant in taking business for next year until they are in better position to see where they are going to come out on semi-finished material. There has been no change in prices, and unless forced to make an advance by increased prices in semi-finished steel, there will be no change. We quote:

Black steel sheets, box annealed, cold rolled, one pass: Nos. 11-12, 2.10c; Nos. 13-14, 2.15c; Nos. 15-16, 2.20c; Nos. 17-21, 2.25c; Nos. 22-24, 2.30c; Nos. 25-26, 2.35c; No. 27, 2.40c; No. 28, 2.50c; No. 29, 2.65c; No. 30, 2.75c. Galvanized, Nos. 10-11, 2.45c; Nos. 12-14, 2.55c; Nos. 15-16, 2.65c; Nos. 17-21, 2.80c; Nos. 22-24, 2.95c; Nos. 25-26, 3.15c; No. 27, 3.35c; No. 28, 3.55c; No. 29, 3.80c; No. 30, 4.05c. Corrugated roofing, $1.75 per square for No. 28 painted, 2½-inch corrugation; $3.10 per square for No. 28 galvanized, 2½-inch corrugation. Quotations f. o. b. Pittsburg on large lots.

Tin Plate.—Many of the large consumers have contracted for requirements for the next six months in the regular line, and in specialties manufacturers who have a larger distribution are expected to quote beyond the first of the year. The supply of semi-finished steel is still inadequate to supply the demand. We continue to quote:

$3.75 per base box, f. o. b. Pittsburg, 14 x 20 100-pound cokes, terms 30 days, less two per cent off for cash in ten days.

Homestead Improvements.—The last of the 60 new open-hearth furnaces at the Homestead plant of the Carnegie Steel Co. was completed last week and the entire group, comprising the largest open-hearth steel plant in the world, is in operation. The capacity of the plant is 6,000 tons of steel every 24 hours, and the greater part of it will be used at the Homestead plant.

CHICAGO.

Great Difficulty in Obtaining Steel.—Mills Crowded With Specifications.

Office of THE IRON TRADE REVIEW, 1362 Monadnock Block, Sept. 24.

The inability of the Union Pacific railway to place an order in this market for 11,500 tons of rolling billets for its mill at Laramie, Wyoming, emphasizes again the shortage in crude steel. Two other inquiries for 10,000 tons of forging billets each, which were "shopped" around several days previous, were also returned, while a miscellaneous lot of orders and offers ranging downwards from 5,000 to 500 tons have had to seek other markets. The billet scarcity becomes more pronounced every week. Pressure for delivery of finished material and an undiminished flow of orders are the main causes for this condition. The Illinois Steel Co. is unable to make any progress on its deferred tonnage. A month ago it had specifications in hand for all materials aggregating 400,000 tons, today they exceed 425,000 tons. Proportionately, nearly every mill is in a similar fix, and months must elapse before this delinquency can be overtaken.

The demand for wire products is particularly heavy, as evidenced by the fact that the American Steel & Wire Co. has a greater tonnage on its books today than ever before in its history. Last Thursday, an advance of $1 a ton in the entire wire schedule went into effect, putting nails on the basis of $1.90 Pittsburg.

There is no cessation in the demand for steel bars and agricultural shapes. Bar iron is easy and all the independent mills are again on basis of 1.50c Pittsburg.

Further structural contracts have been placed for San Francisco buildings. The largest one is for the reerection of the Palace hotel and involves 5,000 tons. This went to the American Bridge Co. Rail contracts from western roads include 4,000 tons for the Milwaukee Electric railway and 16,000 tons additional for the Minneapolis, St. Paul & Sault Ste. Marie railway. Bookings for track supplies continue heavy. Fifty thousand tons of spikes for next year's delivery have been closed by one local interest, and kindred products in equal proportion. Tubular goods are firm and in good demand, the only noteworthy feature being the fact that on the smaller sizes of cast iron pipe makers are pretty generally filled up for the balance of the year. There is some irregularity in pig iron for 1907 delivery, but for spot shipment southern No. 2 foundry is firm at $20.40 Chicago and northern No. 2 $21.00. Scrap is still bullish and higher prices are asked on several products.

Pig Iron.—The timidity felt by buyers towards contracting for wants through the first half of 1907 has developed a somewhat capricious state of affairs. Furnaces are eager to book tonnage for these six months and are discriminating in favor of orders for this period by naming a much higher price for the first quarter or else refusing entirely to quote on the shorter period. Nominally, southern No. 2 for first half is held at $15.50 Birmingham, but sharp contraction in wants that has followed has brought out lower prices, and sales have been made at $14.75, $15 and $15.25 Birmingham. Not many contracts for the entire half have been taken at $15.50, and we hear of none for the first quarter at $16, which is what some sellers are now asking. For spot delivery, however, there is a continual stream of orders. Price scarcely enters into the controversy if the material is en route or on track. Conditions in the south are slow to improve and the shipments of iron against existing contracts are very irregular. Northern irons are without noticeable change. Deliveries from local furnaces continue slow and spot iron is in constant demand. For any delivery this year $21 Chicago can easily be obtained for No. 2 foundry, but for next year's shipment the schedule is 50 cents and $1 a ton lower according to the period covered. Malleable and charcoal irons are moving freely and prices are strong on these grades. The new 350-ton stack of the Federal Furnace Co. at South Chicago, controlled by Pickands, Brown & Co. and associates is nearing completion and will be blown in some time in November. Original plans contemplated the erection of two furnaces and it is understood that work will be begun on the second stack on completion of the first furnace. Our prices are as follows:

Lake Superior charcoal	$20.00 to21 00
Northern Foundry No. 1	20.50 to 21.00
Northern Foundry No. 2	20.00 to 20.50
Northern Foundry No. 3	19.50 to 20.00
Northern Scotch Foundry	20.00 to 21.00
Ohio Strong Softeners No. 1	21.75 to 22.25
Ohio Strong Softeners No. 2	21.25 to 21.75
Southern Foundry No. 1	19.90 to 20.40
Southern Foundry No. 2	19.40 to 19.90
Southern Foundry No. 3	18.90 to 19.40
Southern Foundry No. 4	18.40 to 18.90
Southern No. 1 Soft	19.90 to 20.40
Southern No. 2 Soft	19.40 to 19.90
Southern Gray Forge	17.40 to 17.65
Southern Mottled	16.90 to 17.40
Southern Silveries (4 per cent to 6 per cent Silicon	21.90 to 22.40
Jackson Co. Silveries, 8 to 10 per cent Silicon	24.30 to 24.80
Alabama and Georgia Car Wheel	25.65 to 26.15
Malleable Bessemer	20.50 to 21.00
Standard Bessemer	21.30 to 21.80
Basic Iron	19.40 to 20.35

Rods and Billets.—Large inquiries for billets continue to be made, and each day makes more certain the fact that importations will have to be made to relieve the present stringency. Within the past two weeks, local makers have been asked to bid on three separate inquiries aggregating 31,500 tons, besides a round lot of smaller offers. One of these offers was for 11,500 tons of rolling billets; the other two involved forging billets and were for 10,000 tons each. In each instance the invitation to bid had to be declined. The buyer for the rolling billets is the Union Pacific railway, which requires the steel for its rolling mill at Laramie, Wyo. Either Bessemer or open-hearth will be taken, providing the deliveries can be commenced next month and continued at the rate of 1,500 to 2,000 tons a month. The local sellers are practically out of the market on all kinds of crude steel, and only an occasional carload can be picked up in this market. It requires some effort to secure even this small tonnage, and the want must be urgent to receive consideration. Under such conditions, it is natural that prices should remain extremely firm. Forging billets are quoted from $36 to $38 Chicago, sheet bars $30 Pittsburg and wire rods, $34 to $35 Pittsburg.

Iron and Steel Bars.—Excepting for spot shipment, for which an occasional premium is asked, none of the bar iron mills actively seeking business is getting more than 1.50c Pittsburg for its output. New tonnage has fallen off steadily since the 1.60c price was announced, and to improve the situation the independent mills have dropped back to the lower basis. Specifications for steel bars continue heavy, and mills are falling further behind in deliveries. New tonnage is light because of the long wait for shipments. We quote carload lots, mill shipments, Chicago delivery, as follows:

Bar iron, 1.66½c to 1.71½c; soft steel bars and bands, 1.66½c, half extras; soft steel angles, less than 3 x 3 1.76½c; hoops, 2.06½c base, full extras; old rail stock, 1.65½c. We quote bar iron from stock, 2.20c, full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1¼-inch and larger, $2 per 100 pounds base; 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $1.85 to $1.95 half extras; soft steel hoops, $2.30 to $2.40 full extras. Other sizes not mentioned above, $1.85 per 100 pounds base, plus half extras.

Sheets. — The only change to be noted in the local situation is that an independent mill has advanced its prices on black and galvanized sheets $1 a ton. New tonnage and specifications continue in the same heavy proportions. Deliveries are slow, eight weeks being required on black, and twelve weeks on galvanized material. We quote carload lots, mill shipments, as follows:

Black sheets, Nos. 8, 9 and 10, 1.85c Pittsburg; No. 28 gauge, 2.50c Pittsburg. Galvanized sheets, No. 28 gauge, 3.55c to 3.60c Pittsburg. Freight to Chicago is 16½c per 100 pounds.

Jobbers' prices on less than carload lots, from local store, are as follows: Black sheets, No. 10, 2.30c; No. 12, 2.35c; No. 14, 2.40c; No. 16, 2.50c; Nos. 18 and 20, 2.70c; Nos. 22 and 24, 2.75c; No. 26, 2.80c; No. 27, 2.85c; No. 28, 2.90c; No. 30, 3.35c. Galvanized sheets, Nos. 10 to 20, 3.15c to 3.25c; Nos. 22 and 24, 3.30c to 3.35c; No. 26, 3.50c to 3.55c; No. 27, 3.70c to 3.75c; No. 28, 3.90c to 3.95c; No. 30, 5.10c to 5.15c.

Plates. — Activity is confined largely to specifying against existing contracts. Some new tonnage is constantly coming forward, but its volume is governed largely by the ability to ship promptly. Prices are firm, but without change. We quote mill shipments, as follows:

Tank steel, ¼-inch and heavier, up to 100 inches wide, 1.60c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago is 16½c per 100 pounds.

Jobbers' prices for shipment from local stocks are as follows: Tank steel ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; 72 inches up to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 3-16 inch, 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.15c to 2.25c; flange steel, 25c extra; heads, 25c extra.

Structural Steel.—The only contract of note let this week is for 5,000 tons of structural shapes for the new Palace Hotel at San Francisco, the American Bridge Co. securing the order. A large amount of small business is in transit, local jobbers getting a good share of it since warehouse prices were reduced. Mill quotations are firm, and shipments are reasonably prompt. We quote mill prices as follows: Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from that city to Chicago is 16½c per 100 pounds. Quotations from store are as follows:

All angles, three inches and larger, including six inches, $2.05 to $2.10 per 100 pounds; angles over six inches, $2.15 per 100 pounds base; beams, three inches to 15 inches inclusive, $2.05 to $2.10 per 100 pounds base; channels, three inches and larger, $2.05 per 100 pounds base.

Merchant Steel.—Shafting is about the only product coming under the classification of "merchant steel" on which new tonnage is being sought. Ever since the large dealers were refused a lower price than the "official" schedule, the policy has been to buy from hand to mouth, and most of them are still following this practice. On Gautier material, all the makers are filled up to next June. Specifications are very heavy and in excess of output. Prices are firm but without change. We quote mill shipments, Chicago delivery, as follows:

Planished or smooth finished tire steel, 1.86½c; iron finish, up to 1½ x ½ inch, 1.81½c; iron finish 1¼ x 1¼ inch and larger, 1.66½c, base; channels for solid rubber tires, ¾ to 1 inch, 2.16½c, and 1¼ inch and larger, 2.06½c; smooth finished machinery steel, 1.91½c; flat sleigh shoe, 1.71½c; concave and convex sleigh shoe, 1.96½c; cutter shoe, 2.35c; toe calk steel, 2.21⅛c; railway spring, 1.86½c; crucible tool steel, 6½c to 8c, and still higher prices are asked on special grades. Shafting, 50 per cent off in car lots and 45 per cent in less than car lots, in base territory.

Merchant Pipe.—Specifications and new tonnage continue in about their former proportions. Deliveries are good and prices firm. Both the plants of the Mark Mfg. Co., Chicago, are shut down, the high prices of raw material and the low prices of finished product not being conducive to profitable operation by independent concerns. We still quote on the base sizes, ¾ to six inch black steel pipe, 79.35 per cent discount, and 69.35 per cent discount for galvanized. Shipments from stock are quoted on the basis of 76 to 77 per cent discount on the base sizes.

Boiler Tubes. — Demand for iron and steel tubes is excessively brisk. At the present low prices, contracts are being freely placed for deliveries extending several months into the future. The material is also being consumed rapidly as evidenced by the active nature of specifications. Prices are unchanged, and we quote as follows: 2¾ to 5 inches, steel, 68.35;

iron, 55.35; seamless, 2¾ to 4½ inches, 50.85 per cent discount. Less than carload lots from store, base sizes, are 60 per cent discount for steel; 47½ for iron, and 42½ for seamless tubes.

Cast Iron Pipe.—Little new business has been booked in the week under review. The leading interest is sold up as far as December on the smaller sizes, and for a longer period on the larger sizes. Independent makers are having some trouble in completing their contracts, owing to the difficulty of getting iron, one southern maker being especially hard pressed in this direction. Prices are firm. We quote for Chicago delivery: four-inch water pipe, $34; 6, 8 and 10-inch, $33; 12-inch and larger, $32; gas pipe, $1 a ton higher.

Rails and Track Supplies. — The Cambria Steel Co. has taken a contract from the Milwaukee Electric Railway Co. for 4,000 tons of standard sections. Another contract for western shipment is that placed by the Minneapolis, St. Paul & Sault Ste. Marie R. R., for 16,000 tons. Large sales have been made of track supplies, the leading local interest having contracts on its books for an aggregate of 50,000 tons of spikes for next year's delivery. Bolts, nuts and angle bars have been purchased in equal proportions. Specifications are very heavy the local interest steadily falling behind in deliveries. Prices are without change and we quote as follows:

Bessemer, $28 and open-hearth $29; light rails, Bessemer steel, 30 to 45-pound sections, $29 to $30; 25-pound $30 to $31; 20-pound, $31 to $32; 16-pound, $32 to $33; 12-pound, $33 to $34, and lighter sections, down to 8-pound, $39.50 to $41.50, all f. o. b. mill.

On contracts for spikes and bolts when accompanied by rail orders, the Illinois Steel Co. is asking 2.10c to 2.20c for spikes, and 2.45c to 2.55c for bolts. On miscellaneous business from the general trade, however, other manufacturers are asking 2.45c Chicago, for spikes, 2.85c for bolts with square nuts, and and 3c for bolts with hexagon nuts. Angle bars are held at 1.50c to 1.75c, according to the tonnage and delivery required.

Wire Products.—Effective Thursday, Sept. 20, an advance in the entire wire schedule of $1 a ton, went into effect. This step was forced by the tremendous demand for material that has been felt in the past three months, coupled with the increasing cost and scarcity of raw material and labor. Deliveries are still very slow, as manufacturers are forced to pro rate their output in order to satisfy the persistent demands for shipment that are made from every quarter. The cutting of prices has been wholly eliminated from manufacturing operations, and such as is now heard of is usually attributed and traced to jobbers who shade one product to secure the business on another. Independent makers are said to be uniformly adhering to the schedule, and in some instances are getting a premium for guaranteeing immediate shipment. We have revised our prices to jobbers and quote Chicago delivery, as follows: Wire nails, $2.05; painted barbed wire, $2.20; galvanized barbed wire, $2.50; smooth annealed wire, $1.90; smooth galvanized wire, $2.20; polished staples, $2.20; galvanized staples, $2.45. Carload lots to retailers, 5 cents higher than above prices; less than carload lots, 15 cents higher.

Coke.—Foundry coke strengthens in sympathy with pig iron, and is today selling at $3.50 ovens, or $6.15 Chicago. This quotation applies only to standard 72-hour Connellsville brands. The West Virginia product is quoted at $3.25 to $3.50 ovens, or $5.50 to $5.75 Chicago. Local Solvay coke is strong at $6.15 Chicago. Demand is very good, and contracting for next year's needs is liberal.

Old Material.—The only change observable in the local scrap market is a general stiffening of prices. This may be attributed to the publicity given the statement that the Pullman Co. was negotiating for a round lot of material, especially of iron rails. At once, this product went up about $2 a ton, or to $25.50, and the evenness of this price among local dealers is evidence that some kind of an agreement exists to hold it at that figure. Other products went up proportionately, including heavy melting steel, iron car axles, cast borings, mixed turnings and fish plates. The principal local consuming interests still affect an indifferent attitude to the prices of local dealers, but the latter show no disposition to weaken, especially since they are disposing of their product elsewhere at equally as good prices as those asked in Chicago. The C. B. & Q. Ry. has a new list out this week for 1,500 tons, on which dealers and consumers are bidding actively. We have revised our prices, and quote as follows, gross tons being given in the first paragraph:

Old Steel Rails (4 feet and over)	$17.50 to 18.00
Old Steel Rails (less than 4 feet)	16.50 to 17.00
Old Car Wheels	19.00 to 19.50
Old Iron Rails	25.50 to 26.00
Relaying Rails, subject to inspection	28.00 to 30.00
Heavy Melting Steel	16.50 to 17.00
Mixed Country Steel	13.00 to 13.50

We quote net tons, as follows:

No. 1 R. R. Wrought	$16.50 to 17.00
No. 2 R. R. Wrought	15.50 to 16.00
Shafting	17.50 to 18.00
Dealers' Forge No. 1	12.50 to 13.00
Wrought Pipe and Flues	11.75 to 12.25
No. 1 Cast, 150 pounds and less	15.00 to 15.50
No. 1 Mill	9.00 to 9.50
Mixed Busheling (No. 1 & No. 2)	11.50 to 12.00
Country Sheet	8.00 to 8.50
No. 1 Boilers Cut	11.00 to 11.50
Boiler Punchings	14.50 to 15.00
Iron Car Axles	24.50 to 24.75
Steel Car Axles	20.00 to 20.50
Iron Axle Turnings	11.25 to 11.75
Cast Borings	8.75 to 9.25
Mixed Borings, etc.	8.50 to 8.75
Machine Shop Turnings	9.50 to 10.00
Railroad Malleable	15.00 to 15.50
Agricultural Malleable	14.00 to 14.50
Stove Plate and Light Cast Scrap	12.00 to 12.50
Old Iron Splice Bars	20.00 to 20.50

CLEVELAND.

Estimate of Sales for First Half.—Heavy Contracting for Finished Material.

Office of THE IRON TRADE REVIEW, BROWNING BUILDING, Sept. 25

Iron Ore.—The past week has been entirely favorable to navigation and the September movement is now certain to be extremely large. Labor difficulties at Marquette, involving several days' partial idleness at the docks, and some difficulty with fog and smoke have been the only discouraging features. Nothing has developed in connection with the 1907 ore situation, and no sales have as yet been made.

Pig Iron.—A careful estimate indicates that so far pig iron sales for delivery during the first half of 1907 in the middle west are between 60 and 65 per cent of the entire make for that period. Practically no iron has been sold for June delivery, owing to the fact that that month's output will be on 1907 ore, the price of which is not yet settled. Sales for April and May, while extensive, do not total any large percentage of the output of these months, but practically all the iron that can be turned out during the first quarter is already covered. In fact, several producers are now refusing to quote for first quarter delivery unless a similar amount is taken for the second quarter as well, or are asking higher prices for first half alone. Locally the iron situation is less active, though fully as firm as in the past few weeks. There has been a steady run of inquiries for immediate delivery iron as well as for anticipated deliveries, and consumers are specifying fully on contracts. Spot quotations are about $1.50 higher than for 1907 delivery, though for December $1 above these rates is being accepted. A considerable lot of Bessemer for October, November and December delivery was offered during the week at $19 furnace. Basic is very strong and some good inquiries are pending. Local interests have advanced the price of No. 2 foundry for future delivery to $19 furnace. We quote 1907 delivery, f. o b. Cleveland, as follows:

Bessemer	$19.00 to 19.50
No. 1 Foundry	19.50 to 20.00
No. 2 Foundry	19.00 to 19.50
No. 3 Foundry	18.50 to 19.00
No. 2 Southern	19.10 to 19.60
Gray Forge	17.00 to 17.50
Gray Forge, Southern	16.00 to 16.50
Lake Superior charcoal	20.00 to 21.0

Coke.—Labor difficulties continue in the coke regions and considerable low standard coke is being turned out in consequence. The situation is slightly easier, however, and current quotations are $2.75 for furnace at ovens and $3.75 for foundry.

Finished Materials.—Heavy contracting for the first half of next year is reported, in almost every instance orders being placed for heavier lots than a year ago, and there is every evidence that this is all for requirements in sight. Structurals and plates are selling briskly and steel bars are in strong demand with deliveries more delayed. Considerable sales of forging billets are reported at $36 to $37 delivered at Cleveland. They are extremely scarce, however, as is evidenced by the fact that one order during the week for local requirements was placed in Birmingham, Ala. A strong inquiry continues for bar iron and local mills are securing better output with the coming of cooler weather.

Old Materials.—Mills are hesitating about buying with prices at the present level and dealers are holding firmly for current quotations with a waiting market and light trading the result. Consuming interests state that when they do buy, unless prices are reduced, it will be for smaller tonnages, but dealers are firm and insist that industrial conditions will make heavier requirements certain. Prices are unchanged as follows, for Cleveland delivery:

Old iron rails	$23.50 to 24.50
Old steel rails (over 6 feet)	17.50 to 18.50
Old steel rails (under 6 feet)	17.00 to 17.50
Old car wheels	17.50 to 18.00
Steel boiler plate	15.00 to 15.50
Steel axles	20.00 to 21.00
Malleable iron (railroad)	16.50 to 17.00
Malleable iron (agricultural)	14.00 to 14.50
Heavy steel	16.50 to 17.00
Country mixed steel	14.50 to 15.00

We quote net tons as follows:

No. 1 R. R. wrought	$18.00 to 18.50
No. 1 busheling	14.50 to 15.00
No. 1 machine cast	14.75 to 15.25
Iron axles	23.50 to 24.50
Axle turnings	11.00 to 11.50
Wrought turnings (free from cast)	10.00 to 10.50
Grate bars	11.50 to 12.00
Pipes and flues	14.00 to 14.50
Tank iron	12.00 to 12.50
Hoop and band iron	8.50 to 9.00
Sheet iron	7.50 to 8.00
Wrought drillings	10.00 to 10.50
Stove plate	11.00 to 11.50
Cast borings	7.50 to 8.00

CINCINNATI.

High Prices for Prompt Iron, but Little Business Being Done.

September 24.

Pig Iron. — The market the past week has shown no material change. There has been only a moderate volume of business and trade has quieted down. Offerings for the balance of the year are light and for the higher grades sellers ask higher figures than a week ago. Prices for near deliveries are very irregular, ranging from $16.00 to $17.00 Birmingham, for southern iron and from $19.00 to $20.00 at furnace for northern brands. For next year southern iron is still obtainable at $15.00 Birmingham, although the furnaces that are asking above this price are increasing in number. Northern iron is quoted at $18.00 for next year as a minimum while some furnaces are asking $18.50 and one company wants $19.00 at furnace.

There has been more activity in gray forge this week with sales at $13.50 and $14.00 Birmingham for this year's delivery, but at the close of the week one large inquiry is in the market on which it is difficult for sales agencies to find enough iron of the kind wanted to quote on.

An order was issued by the southern railroads recently which would prohibit the changing of the destination of iron in transit except by applying a combination of local rates instead of correcting the billing, so that the through rate from point of shipment to the changed destination would apply. This order, if enforced, would probably have had some effect on the market, but we learn now that the order has been withdrawn.

There is still considerable talk of scarcity of labor in the southern furnace districts and difficulty in getting out limestone.

A carefully prepared statement of the furnaces in and out of blast in the south, including the Virginia district, shows that out of a total of 81 furnaces 62 are in blast and 19 are out and of eleven charcoal furnaces six are in and five out. There are practically no new stacks being built in the south and two or three of the furnaces now making foundry iron are expected to go onto basic iron within the next six months.

Most of the southern furnace men are strong in their views and iron is not being urged at present for next year at prices now current. For delivery over the balance of this year we quote f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$19.50 to 20.00
Southern Foundry No. 2	19.00 to 19.50
Southern Foundry No. 3	18.50 to 19.00
Southern Foundry No. 4	17.75 to 18.00
Southern Foundry No. 1, soft	19.50 to 20.00
Southern Foundry No. 2, soft	19.00 to 19.50
Gray Forge	17.00 to 17.25
Northern Foundry No. 1	20.65
Northern Foundry No. 2	20.15
Northern Foundry No. 3	19.65
Jackson County Silvery, 8 per cent	23.15
Southern Charcoal	25.50 to 26.00

Finished Material.—The market remains firm with a fairly good demand in a jobbing way for about everything on the list. With mills behind in deliveries jobbers are having an active trade.

We quote: Bars at 1.73c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets No. 10 and No. 12, in car lots are 2.68c. We quote black sheets, No. 27 at 2.53c in car lots of 500 bundles. Black sheets out of store are selling as follows. No. 28, 2.90c; No. 27, 2.70c; No. 16, 2.25c; No. 14, 2.20c; No. 12, 2.15c. Tank plates are firm and sell out of store at 2c to 2.10c for ¼-inch and 2.10c for 3-16 Nos. 8 and 10. Beams and channels are quoted at 2.25c to 2.35c from stock and angles at 2.10c to 2.15c for base sizes.

Coke.—The market is firm and ovens are strong in their views. While the range in prices is unchanged some operators have advanced their asking figures. Labor in the coke fields is still scarce. Prices in the leading coke producing districts are as follows:

Wise County, Va. Furnace Coke prompt shipment	$2.50 per ton
Wise County, Va. Foundry Coke on contracts	3.25 to 3.50 per ton
Pocahontas Furnace Coke prompt shipment	$1.85 to 2.25 per ton
Pocahontas Foundry Coke on contracts	2.75 to 2.85 per ton
Connellsville Furnace Coke prompt shipment	2.60 to 2.85 per ton
Connellsville Foundry Coke on contracts	3.65 to 3.75 per ton
New River Foundry Coke on contracts	3.00 to 3.25 per ton
New River Furnace Coke, prompt shipment	2.25 to 2.50 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.65 to $1.70 per ton on $9.00 pig iron, plus 17 percent of the advance on pig iron above $9.00 Birmingham.

Old Material.—Dealers are asking strong prices and the market is firm. Melters are hesitating to pay the current prices demanded and trade is quiet. We quote f. o. b. Cincinnati as follows:

Old No. 1 railroad wrought, net tons	$17.50 to 18.00
Cast machine and foundry, net tons	14.50 to 15.00
Old iron rails, gross tons	23.50 to 24.00
Old steel rails, gross tons	17.50 to 18.00
Old short lengths, gross tons	17.00 to 17.50
Old iron axles, net tons	23.00 to 24.00
Heavy melting scrap, gross ton	19.00 to 19.50
Stove plate, net tons	10.50 to 11.00
Wrought turnings, net tons	10.00 to 10.50
Cast borings, net tons	7.50 to 8.00
Car wheels, gross tons	17.00 to 18.00

NEW YORK.

Pig Iron Market Quiet but Strong.—Increased Inquiry for Structural Material.

Office of The Iron Trade Review, Room 1315, No. 150 Nassau St., Sept. 24.

Pig Iron. — The market is more quiet than it has been for some weeks past, but prices are extremely firm and business is anything but dull. Of course transactions have not been either so numerous or so large in the aggregate as they were in the few weeks preceding, but there has been a great deal of unostentatious buying and the demand is

considerable. Such enormous sales as marked the first week in September could not continue indefinitely even under the tension which has been a feature of this movement, but conditions have not materially changed. The fact that premiums for spot iron continue to be offered varying from one-half to two dollars a ton shows that the pressure is not relieved to any marked extent. Indeed, producers are beginning to talk confidently of higher prices to last throughout the winter.

Buying for delivery during the first half of 1907 has not been so large in volume as last week, but business involving immediate shipment has been quite as brisk. All sorts of prices have been paid for prompt shipment, $21 at the furnace for northern iron and $17, Birmingham, for southern No. 2, not being at all extraordinary. There are ugly stories of sharp practice of a producer who, while far behind on contract shipments to a consumer, offers that same consumer spot iron at a greatly enhanced figure "from another furnace."

Sales have been mostly of foundry grades in moderate sized lots varying from 50 to 500 tons. There were sales of 500 tons of southern No. 2, at $15.50, Birmingham, next year's delivery; 200 tons of No. 3, southern at $14.50, Birmingham, delivery during the first half; 200 tons northern No. 2, future delivery, $19 at the furnace, and many others of a similar nature. Gray forge is still slow owing to labor trouble in consuming mills, but there were a few sales and at a significantly higher price. There has been no business of importance in basic, but there is a lot under negotiation also at a higher price.

Ferro-manganese is strong with reports of more serious trouble at the source of ore supply in the Caucasus. There were sales during the week aggregating 3,000 tons. For future delivery $80 is asked and for early shipment about $85 per ton.

It is impossible to give quotations for spot foundry iron which have any value. They vary according to the needs of the consumer and the disposition of the seller. The following are prices at tidewater for future delivery:

Northern No. 1 Foundry	$20.00 to 21.00
No. 2 Foundry	19.50 to 20.50
No. 2 Plain	19.00 to 20.00
No. 1 Southern Foundry	19.50 to 20.50
No. 2 Southern Foundry	19.00 to 20.00
No. 3 Southern Foundry	18.50 to 19.50
No. 4 Foundry	18.00 to 18.50

Certificates and Contracts.—There has been only a languid interest in the trading in pig iron certificates and standard foundry contracts on the New York Produce Exchange. Even the prices are not what they might reasonably be expected to be in view of the quotations prevailing in the general market. There were a few sales but none of importance. The following are today's quotations for standard foundry contracts:

Standard Foundry Contracts.

	Bid.	Asked.
September	19.00	
October	19.00	20.00
November	19.00	19.50
December	19.00	19.50
January	18.50	19.25
February		19.25

Finished Iron and Steel.—The feature of the week has been renewed buying of standard rails by the railroads. The aggregate of the business consummated is well above 100,000 tons. The railroads are also entering the market for additional bridge material, a large tonnage of which is to be placed before the end of the present year. Although there were a number of small orders, the total rail sales would not have been above the average had it not been for the award of the New York Central system of some 80,000 tons, divided as follows: Lake Shore & Michigan Southern, 32,000 tons; Cleveland, Cincinnati, Chicago & St. Louis, 31,000 tons; Michigan Central, 12,000 tons; Cincinnati & Northern, 3,000 tons; and Lake Erie & Western, 2,000 tons. It is expected that this system will have further needs during 1907. A number of southern roads are still in the market for considerable tonnages which are likely to be placed within a few days.

Business in structural material has so far recovered from its annual period of dullness that the American Bridge Co. expects to have no difficulty in booking its 60,000 tons in September. The contracts of the week were many, although none unusually large. Probably the most interesting order concerned the famous Palace Hotel in San Francisco for the rebuilding of which the American Bridge Co. is to furnish 5,000 tons of steel. The same corporation also secured the following contracts: steel for track elevation at Indiana Harbor, 1,700 tons; bridge work, the Grand Trunk, 1,200 tons; the Pennsylvania lines, 1,300 tons; the St. Paul, 400 tons; a building in New York City, 700 tons; a building for the Carnegie Steel Co., 700 tons; a cement plant in Pennsylvania, 625 tons; and a bridge for the Wheeling & Lake Erie, 100 tons. Inquiries are coming in more freely and are of a more desirable nature.

Trade in steel plates has been of a very satisfactory character. Several contracts involving varying tonnages are under negotiation in this district, including 400 tons of plates for a new Hudson river boat for the People's line. While not so large as the Hendrick Hudson, it will be longer than 300 feet. A firm in Greenpoint, L. I., will also require a large tonnage in the near future. The action of the Eastern Bar Iron Association which last week reaffirmed the old price of $1.50, base Pittsburg, has not materially affected the market. Many of the mills in the territory are out of the market owing to a prolonged strike of puddlers and the others are experiencing no difficulty in securing from $1.60 to $1.70 for their product. The association passed a resolution urging its members to secure $1.60, although the official price remains $1.50. The nut and bolt manufacturers who met on the same day, decided to advance prices 5 per cent.

The following are prices at tidewater: Angles, 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84½c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine boiler, 2.41½c; refined iron bars, 1.74½c to 1.84c; soft steel bars, 1.64½c to 1.74½c; sheets, No. 28 black, 2.50c.

Old Material.—The scrap market has undergone little change during the week, dealers still being more anxious to buy than the consumers. The market is strong and active with prices advancing in some grades of stock. Consumers are buying as little as possible and in some cases dealers are offering 50 cents per ton more than the mills. Among the sales reported were: 800 tons strictly scrap rails of heavy section; 500 tons iron rails, and 100 tons of heavy melting steel. Cast scrap is in good demand. The following are prices approximately f. o. b. tidewater:

Old iron rails	$25.00 to 25.50
Old steel rails, long lengths	16.50 to 17.00
Old steel rails, short pieces	15.50 to 16.00
Relaying rails	25.00 to 26.00
Old car wheels	18.00 to 19.00
Old iron car axles	29.00 to 30.00
Old steel car axles	20.00 to 21.00
Heavy melting steel scrap	15.50 to 16.50
No. 1 railroad wrought scrap	19.00 to 20.00
Iron track scrap	18.00 to 19.00
Wrought pipe	13.50 to 14.00
Cast borings	11.00 to 11.50
Wrought turnings	12.50 to 13.75
Heavy Cast Scrap	16.00 to 17.00

PHILADELPHIA.

Premiums Offered for Prompt Iron.—Conditions of Furnaces.

September 25.

Pig Iron.—The disposition of the market to ease off in prices, which was noted last week, has received a check through the accumulating evidence that there are still many consumers, both large and small, who have not fully covered for the remainder of 1906 and their efforts to get needed iron. The premiums offered by these tardy buyers, ranging from 50 cents to $2 a ton, keep prices at the top notch. Reports made to the meeting of the Eastern Pig Iron Association, which was held in this city last week, have also given new strength to the market. These showed that practically all the fur-

naces in this territory were sold up for over five months ahead and that substantially no new business could be taken for delivery previous to the second quarter of 1907. The situation, as discussed by the furnace men, was pronounced most satisfactory as to price and volume of trade, but not so pleasing from the standpoint of deliveries strictly according to contract. The rejuvenation of old furnaces, which have been out of blast for some time, is expected to add materially to future production, but none of these can be made ready for operation this year and cannot relieve the present situation. Among those reported to have been caught unprepared by the scarcity of pig iron is a large firm of pipe founders, who have been seeking to place an order for several thousand tons for December delivery. Their inability to secure the needed amount here may lead to the importation of English pig iron. Prices are still very variable, according to the premium which hard pressed customers are willing to pay. Eliminating these because of the difficulty of giving anything like accurate quotations, and taking the market for the first half of 1907 as the basis, prices may be said to be unchanged from last week as follows:

No. 1X Foundry	$21.50 to 22.50
No. 2X Foundry	20.50 to 21.50
No. 2 Plain	20.00 to 20.50
Standard Gray Forge	17.75 to 18.25
Basic	18.50 to 19.00
Low Phosphorus	24.75 to 25.25

New Material.—A significant feature of the new business in sight is the order placed last week by the Pennsylvania R. R. for 12,400 freight cars for 1907 delivery, all of which are to be either entirely of steel or with steel underframes. The order is understood to be only a preliminary one, and will be followed later by another still larger. The company's requirements for this year were 35,000 cars. Bar iron is stronger, and the demand for plates and structural material shows no diminution. Premiums are being asked, and prices show some advances as follows: Beams, channels and angles according to specifications, 1.83½c to 2c; refined iron bars, 1.83½c to 1.88½c; steel bars, 1.83½c to 1.88½c; plates, 1.73½c to 1.83½c.

Old Material.—There is an active demand for scrap by both dealers and mills, and prices continue to improve. Much of the speculative buying is based on the theory that, in view of the big advance in pig iron, the mills must make a more liberal use of scrap. Many of them, however, refuse to meet the prices offered by the dealers, and most of the material sold goes to the latter. Prices may be quoted as follows:

Old steel rails	$18.25 to 18.75
No. 1 steel scrap	18.00 to 18.50
Old steel axles	22.25 to 22.75
Old iron axles	30.00 to 31.00
Old iron rails	24.00 to 24.50
Old car wheels	18.50 to 19.00
Choice scrap, R. R. No. 1 wrought	21.00 to 22.00
No. 1 yard scrap	19.00 to 20.00
Machinery scrap	17.50 to 18.00
Low phosphorus scrap	22.50 to 23.00
Wrought iron pipe	15.75 to 16.25
No. 1 forge fire scrap	15.50 to 16.00
No. 2 forge fire scrap, ordinary	12.00 to 12.50
Wrought turnings	13.75 to 14.25
Axle turnings, heavy	14.50 to 15.00
Cast borings	11.00 to 11.50
Stove plates	13.75 to 14.25

ST. LOUIS.

More Activity in Pig Iron.—High Prices for Spot.

September 24.

There was more activity in the local iron market in the last week than there had been in the four weeks preceding. Melters who had cut their orders a little short on account of the high prices came to the point where they were forced to buy. On top of these orders for current delivery came the buying of the stove interests for first quarter, closely followed by the placing of contracts for the first four months of the American Car & Foundry Co. In all, something like 30,000 tons of iron was contracted for.

One stove factory took 1,400 tons, another 1,000 tons and another 400, all in St. Louis. A Quincy, Ill., stove maker took 400, and there were several other stove contracts which made a total of about 7,000 tons. The American Car & Foundry Co. bought 20,000 tons for its plants to cover the first four months of the next year. These contracts are for various grades of iron and were divided between the St. Louis houses, with a contract for charcoal iron going to Chicago.

For the first time in months there is a scarcity of high silicon iron. Nearly all of these off grades were wiped up during the scarcity of iron, when all grades were accepted on contracts for foundry and now it is hard to find even a carload of it. Charcoal iron is also scarce.

Iron for prompt delivery still commands fancy prices, as high as $17.50 Birmingham basis being reported for iron on track in East St. Louis. Sixteen dollars to $16.50 is the ruling price for the last quarter of 1906. Iron for the first and second quarters of 1907 is commonly quoted from $15 to $15.75 with the selling price generally $15.25 to $15.50. Several furnaces have instructed their representatives that they will not book any orders under $15.50 for that period. A strong feature in the market is the confidence in the future, which has caused a decided strengthening in the second quarter price. The tendency today is to hold it at the same price as first quarter.

We quote prices for last quarter on deliveries in St. Louis as follows:

Southern No. 1	$20.00 to 20.50
Southern No. 2	19.50 to 20.50
Southern No. 3	19.00 to 19.00
Southern No. 4	18.50 to 19.00
Gray Forge	18.25 to 18.50

Coke.—On reports of supply shortage and inability to get coke for current orders coke advanced 50 cents in the local market this week, bringing the price up to $6.80 in East St. Louis.

Finished Material.—New projects of interest for finished material are the proposed pipe line from Sulphur, I. T., to the Gulf and two 17-story office buildings at Broadway and Olive street.

BIRMINGHAM.

Plans for Increasing Supply of Raw Material for Furnaces.

September 24.

Reports gathered from offices of iron companies in Birmingham are to the effect that there is a good demand for pig iron to be delivered during the first six months of the coming year and that some of the product is going as high as $16 per ton. The general price for iron to be delivered during the first half of the coming year is placed between $15 and $15.50 per ton, No. 2 foundry basis. There is but little spot iron to be had and what there is of it brings $17 per ton easily. Some sales are being made in spot iron, but the lots are of such small capacity that it is almost foolish to mention them. The production in this district has improved but little in the last two months. The Woodward Iron Co. has started up its furnace which has been under repairs for some time and the production should be increased at this point something like two hundred tons a day. This company, though, has had in operation always heretofore, two of the three furnaces. Efforts are being made to keep all three of the iron makers going.

The shipment of pig iron from the Birmingham district is steady. The home consumption is heavy and all prospects are bright. The announcement made a few weeks ago that there was a scarcity of raw material for the furnaces is followed with the statement that at least two new ore mines are being opened, two additional limestone quarries are being worked on and shortly will be ready to furnish good fluxing material and that old coke ovens are to be started up shortly. Preparations are being made to

have a full supply of raw material when the cold and wet weather starts in, the weather that interferes with the outside work at the mines. There are but a few furnaces in the Birmingham district which have their bins well filled with raw material. There is a little shortage of railroad cars noted in the industrial fields of Alabama and a prompt handling of the various products to the furnaces is hindered. This, it is claimed, has something to do with the shortage of supplies at the furnaces and will be relieved only when the transportation companies are in a position to handle the ore, coal, coke and limestone as promptly as the need demands.

Metal Market

NEW YORK.

September 24.

Pig Tin.—There has been an easier feeling during the week but today the market was firmer but quiet.

The following are today's quotations: Spot and September, 40.32½ to 40.50; October, 40¼ to 40.50; November, 40⅛ to 40.50. London, £185 5s and £184 5s. Arrivals for the month to date 2,627 tons. Afloat, 3,435 tons.

Copper.—The market rules strong, trade in warrants abroad being active. Today's quotations: Lake, 19⅜ to 19⅝; electrolytic, 19⅛ to 19⅜; casting, 19 to 19¼; London, £89 15s for both. Exports for the month to date, 7,712.

Lead.—The demand has been fair and the market is firm. Today's quotations. 5.97½c to 6.02½c; St. Louis, 5.90c. London, £18 10s.

Spelter.—Refined spelter has been active and higher during the week but at present the market is easier. Today's quotations: 6.25 to 6.35; St. Louis, 6.25; London, £27 12s 6d.

Antimony.—There has been no change, prices remaining the same.

CHICAGO.

September 24.

There is a good demand for metals and prices are firm. Spelter has advanced $5 a ton, and is now quoted at 6.50c to 6.55c for prompt delivery. Copper is also ¼ of a cent per pound higher, prevailing prices for Lake being 19½c to 19¾c; casting, 19¼c to 19½c; less than car load lots, ¼c to ½c higher. Pig tin is unchanged at 42c. Lead, desilverized is offered at 6c to 6.05c for 50-ton lots; on car lots, 2½c per 100 pounds higher; sheet zinc, $7.75 list, f. o. b. LaSalle in car lots of 60-lb. casks. Cookson's antimony, 27c to 28c; Hallett's, 26c to 27c.

The bullish condition of iron and steel scrap has had its effect on scrap metal, and prices are slightly higher. We quote dealers' buying prices as follows: Copper wire, 16½c; heavy copper, 16¼c; copper bottoms, 15½c; copper clips, 16c; red brass, 15½c; yellow brass, heavy, 11¾c; yellow brass borings, 10½c; red brass borings, 13½c; light brass, 8½c; pipe lead, 5.15c; tea lead, 4¾c; zinc, 4.40c; tin foil, 31c and pewter, No. 1, 25c.

ST. LOUIS.

September 24.

The spelter market was steady today at $6.25, an advance of five cents over the high quotation of last week. Over 1,000 tons of spelter was bought during the week at this figure, the heaviest trading in months. Improvement in the price of zinc ore is reported from the Missouri-Kansas field, the highest price paid being $47 for one carload.

Lead was quiet, but firm today at $5.85 to $5.90 for Missouri brands, and $6 for special soft brands. Some light sales were made during the week at $5.85, but the metal is held at $5.85. The shipment of lead ore was the second largest of the year with $82.50 the top price.

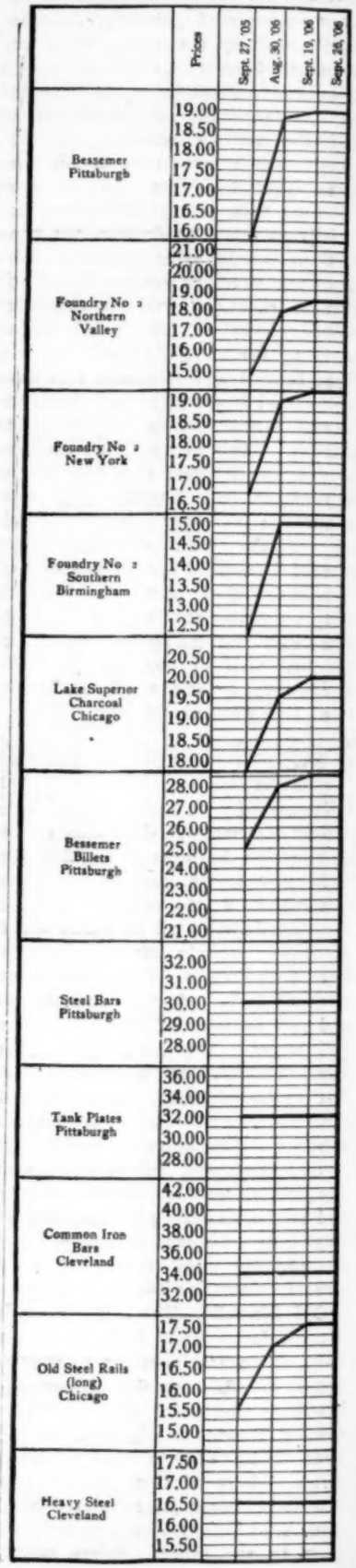
THROPP PURCHASES SAXTON FURNACE.

Congressman J. E. Thropp, of Pennsylvania, announced last week that he was the purchaser of the Saxton blast furnace in Bedford county, Pa., recently sold at bankrupt sale. Mr. Thropp is also the owner of the Everett furnace, some 15 or 20 miles distant from the Saxton, and of the Catoctin furnace, near Hagerstown, Md., which has been out of blast for some time. His latest acquisition makes him, with the exception of Joseph Wharton, of Philadelphia, the largest individual furnace owner in the United States. Steps have already been taken to put the Saxton furnace in operation, and orders have been taken for the January delivery of iron from it. Mr. Thropp expects to use in it the same limestone and local ores, mixed with Lake Superior ore, which are used in the Everett furnace. The Coatesville property of the Saxton Furnace Co. was purchased by Worth Bros., of that place.

The Anvil furnace at Pottstown, Pa., which has been leased by the Warwick Iron & Steel Co., for 18 years, is expected to get into operation about the same time after extensive remodeling and repairs. It will run on foundry iron, and Pilling & Crane will be the selling agents for it, as also for the Saxton furnace.

PRICE CHART.

(Pig Iron Quotations are For Delivery During First Half of 1907)



GREAT INCREASE

In Production of Cement by the Steel Corporation.—New Capacity.

The Universal Portland Cement Co., a new subsidiary company of the United States Steel Corporation, will take over the plants and business of the cement department of the Illinois Steel Co., Oct. 1, and will continue the manufacture of "Universal" Portland cement of the same high quality as heretofore. Edward M. Hagar, who has for six years been manager of the cement department of the Illinois Steel Co., will be president of the Universal Portland Cement Co., with headquarters in the Rookery building, Chicago. A Pittsburg office will also be opened.

The board of directors will be as follows: Judge E. H. Gary, chairman board of directors, U. S. Steel Corporation; Mr. E. J. Buffington, president, Illinois Steel Co.; Mr. A. C. Dinkey, president, Carnegie Steel Co.; Mr. T. J. Hyman, secretary and treasurer, Illinois Steel Co.; Mr. Edward M. Hagar, president, Universal Portland Cement Co.

The present output of 6,500 barrels a day of "Universal" Portland cement at South Chicago, Ill., and Buffington, Ind., is being increased by a new plant at Buffington, with a capacity of 6,000 barrels a day and a plant at Universal, Pa., near Pittsburg, to have a capacity of 4,500 barrels a day of "Universal" Portland cement. When the new plants are in operation in the summer of 1907 the total output of the Universal Portland Cement Co. will be 17,000 barrels a day.

The cement manufactured in the new mills as well as the old, will be made from slag and limestone by the same special process and under the same supervision which has been so successfully employed by the Illinois Steel Co. since May, 1900. In the manufacture of "Universal" Portland cement, the two raw materials—crushed limestone and chilled blast furnace slag—are first dried, thoroughly ground together in proper proportions, and burned to a clinker in rotary kilns. This clinker is afterwards finely ground and the resulting product is a true Portland cement, its method of manufacture, chemical composition, and specific gravity being strictly in accordance with the definitions of the most prominent cement authorities in the United States and Europe.

The remarkable increase in demand for "Universal" Portland cement, an evidence of its high quality, is shown by the following figures of production by years since first placed on the market:

1900	32,443	barrels
1901	164,316	"
1902	318,710	"
1903	462,930	"
1904	473,294	"
1905	1,735,343	"
1906 (Estimated)	2,200,000	"

The production of "Universal" Portland cement has shown a steadily increasing percentage of the production of the entire country and in 1905 exceeded the production of the United States in 1896. When the new mills are in operation, the output of the Universal Portland Cement Co. will exceed ten per cent of that of the entire country.

Both the new plants will be driven entirely by electric power from generators connected to gas engines using blast furnace gases. The power will be transmitted ten miles to Buffington from South Chicago at 22,000 volts from two 2,000-kilowatt generators located at the south works of the Illinois Steel Co., from which point the supply of slag will be obtained. For the plant at Universal, Pa., near North Bessemer, the power will be transmitted seven miles from two 2,000-kilowatt gas-engine-generator units at the Carrie furnaces, Homestead works of the Carnegie Steel Co., which furnaces will also supply the slag.

The cost of the two new plants will be $3,000,000 and the equipment will be such as to make them modern and efficient in every way.

Contracts have been placed for 21 rotary kilns seven feet six inches in diameter and 120 feet long, 47 tube mills, and for dryers, preliminary grinders, etc., these orders being the largest ever placed at any one time for cement making machinery. The Power & Mining Machinery Co., Milwaukee, Wis., secured a large share of this equipment.

The buildings at each of these cement plants consisting of raw material bins, dryer building, raw material mill, burner building, finishing mill, stock houses and miscellaneous buildings, such as machine shop, transformer station, office and laboratory, are being built entirely of steel and concrete, the largest buildings being stock houses, 600 feet long and 100 feet wide, giving a storage capacity at each plant of over 400,000 barrels of finished cement.

The New York Bolt & Nut Association, at a meeting held last week in New York, decided upon a five per cent advance on nuts, bolts, etc., in sympathy with the recent $2 a ton advance in bar iron. The Bar Iron Association also held a meeting and reaffirmed prices.

MOTORS FOR GARY RAIL MILL.

(Special Telegram.)

Chicago, Sept. 25.—The Indiana Steel Co., Chicago, has awarded the contract for the motors to drive the Gary rail mill to the General Electric Co., Schenectady, N. Y. Six motors are included in the order, two of 2,000 horsepower each, operating at 214 revolutions per minute, one of 2,000 horsepower, operating at 88 revolutions per minute, and three of 6,000 horsepower each. The latter will make 88, 83.3 and 75 revolutions per minute, respectively. The three 2,000-horsepower motors are rated at 3,000 horsepower each for one hour with a temperature rise of 60 degrees Cent. and the three 6,000-horsepower motors are rated at 9,000 horsepower each for the same length of time and temperature rise. The contract includes all controlling apparatus and covers the cost of installation ready for operation. Eighteen passes will be given the bar from the time it enters the mill in the form of an 8,500-pound ingot until it is rolled into standard sections. Four passes will be given in the two high continuous blooming mill, five in the three high blooming mill, three in the three high finishing mill and single passes in the remaining two high stands. Two of the 2,000-horsepower motors will drive the four stands of continuous blooming rolls, one 6,000-horsepower motor will drive the three high finishing mill, second edger and leader passes, another 6,000-horsepower motor will drive the three high blooming mill and the third will drive the dummy and first edger; the remaining 2,000-horsepower motor will drive the stand of rolls in which the finishing pass is given.

Boilers for Gary.—The Rust Boiler Co., Pittsburg, Pa., has secured the order for the boilers for the United States Steel Corporation's new plant at Gary, Ind., the order being for sixteen 400-horsepower Rust water-tube boilers.

Quinn Furnace Starts.—After many months occupied in practically rebuilding, the Quinn Furnace Co., applied the torch at Gadsden, Sept. 17. The company has enough ore and charcoal on hand to run the plant at least six weeks with a capacity of 60 tons of charcoal iron daily. The furnace has charcoal orders on its books which have been accumulating for nearly a year. The company will make its own charcoal, for which purpose 140 ovens have been installed. It is also planned to build a steamer to bring down the timber for the ovens.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND

BOSTON DULUTH
CHICAGO NEW YORK
CINCINNATI PHILADELPHIA
PITTSBURGH

Subscription, $3.00 per annum. To Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co., will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND, AS SECOND CLASS MATTER

PRINTED IN AN OPEN SHOP

September 27, 1906

CENSUS STATISTICS.

In our issue for Sept. 6 we called attention editorially to what seemed to us to be some rather serious faults committed by the census bureau in its grouping of products in its preliminary report of the production of steel ingots and castings and rolled iron and steel in the calendar year 1904, the bureau having combined iron and steel wire rods with merchant bars and rods, and steel ingots produced for sale with direct steel castings. We also called attention to the fact that, while it took the census bureau about seventeen months to issue its preliminary statistics of the production of steel ingots and castings and rolled iron and steel for the calendar year 1904, the American Iron and Steel Association published full and complete statistics for 1904 for the same products in from two to six months after the close of that year.

We, of course, sent a copy of the issue containing our editorial to the census bureau, and soon afterwards received a letter from the Hon. S. N. D. North, the director of the census. In this communication Mr. North says:

"In preparing the preliminary summary it was necessary to consolidate a number of the items that will be published in detail in the final report. The statistics for the different classes of bars, rods, and ingots will be shown separately, and I inclose a statement giving these details, which I hope you will publish. I regret that you prepared the editorial without consulting the office, as it is our practice to furnish details for publication whenever desired. As the editorial stands, it will not agree with the census reports and can not be accepted as an authority. Certainly it is not a fair criticism."

We take pleasure in complying with Mr. North's request, and the details referred to will be found in another column. But, we certainly do not agree with the statement contained in the last sentence of Mr. North's communication. In our opinion the criticism was entirely fair and just. It was not only not necessary but entirely unnecessary to group wire rods with merchant bars and ingots produced for sale with finished steel castings. We desire to repeat that this grouping "showed either bad judgment or lack of knowledge of the statistical data which the iron and steel manufacturers desired." The mere fact that Mr. North now requests us to publish separately the statistics of the production of wire rods and merchant bars and of ingots produced for sale and direct steel castings is an admission on his part that the grouping adopted by his bureau was "incongruous" and "detracted from the usefulness and value of its work."

Concerning our criticism of the failure of government bureaus to collect and publish statistical information as promptly as private organizations Mr. North says:

"The delay in publishing census reports is due primarily to the fact that the manufacturers will not furnish the information. If each establishment should send its report to the census promptly upon the close of the census year, the statistics would be compiled and made public within two or three months. All of the year 1905 and a portion of the year 1906 was consumed by the office in securing information from manufacturers. While manufacturers are required by act of congress to furnish these reports, and a penalty is provided for refusal, I have uniformly refrained from instituting legal proceedings, as I feel that information of this character to be satisfactory must be furnished voluntarily. It would be impossible to institute legal proceedings against manufacturers and have them terminate in time to meet the requirements of the census."

There is doubtless a great deal of truth in what Mr. North says concerning the delay experienced by the census bureau in securing reports from manufacturers generally. But, is not a great deal of this delay caused by the inquisitorial character and the large number of inquiries which the census bureau insists upon incorporating in its schedules? For instance, all operators of rolling mills or steel works were required by the census of 1904 to fill out two schedules—schedule No. 1 of a general character and a supplemental schedule prepared especially for rolling mills and steel works. To answer all the interrogatories on these two schedules it was necessary for every iron and steel manufacturer to make over 375 entries. The inquiries covering the earnings of wage earners alone required 60 entries. It is this "fine tooth" system which the census bureau has adopted which irritates manufacturers and exhausts their patience. In our opinion it is this system which is largely responsible for the delay experienced by the census bureau in securing statistics from the manufacturer of the country. As a rule manufacturers are quite willing to answer all reasonable and pertinent inquiries concerning the tonnage and value of their output. But they are not willing to answer a long string of irrelevant questions which relate to what they justly consider to be their private business affairs.

The American Iron and Steel Association published complete statistics of the production of pig iron in the United States in 1904 in less than thirty days after the close of that year, but it was not until some fourteen or fifteen months later, in the spring of 1906, that the census bureau issued its preliminary statistics of the country's output of pig iron in 1904. For steel ingots and castings and certain forms of rolled iron and steel the association published full statistics for 1904 in its *Bulletin* in the early month of 1905, and in June of the same year its annual report was issued, containing complete statistics for all leading forms of finished rolled iron and steel. Similar statistics, however, were not made public by the census bureau until late in the spring of 1906, and even

these statistics were not final. Surely Mr. North's bureau should do better than this. Apparently the association does not experience the delay in hearing from manufacturers of which Mr. North complains. The clerical force and the expenditures in a private association are necessarily limited, but in the census bureau they are practically unlimited. The bureau doubtless has the best mechanical contrivances obtainable for tabulation, and employs up-to-date methods in compiling the data it receives from the different manufacturing industries. But in our opinion it is seriously handicapped by the unnecessarily large number of interrogations it requires manufacturers to answer and perhaps by the fact that the clerks who tabulate the schedules received from manufacturers are not familiar with the various manufacturing industries upon which they are at work. In other words they are not specialists. Private organizations or associations, on the other hand, confine their inquiries to a few leading and special lines and have clerks who keep in touch with these lines, and are therefore capable of doing intelligent and expeditious work. The result is that the private organization is able to issue prompt and reliable statistics in a few months after the close of any given period, while the census bureau notwithstanding its large force and labor-saving devices, does not seem to be able to get out similar information to the same industries until perhaps eighteen months or two years have elapsed.

We have no doubt of Mr. North's fitness and ability for the position he occupies, but until he has demonstrated otherwise we shall adhere to our opinion that statistics to be of value must be published promptly, and that statistical information which reaches our manufacturers through a government bureau a year or two after similar information has been published by a private organization can be of but passing interest to the rank and file of our manufacturers.

Mr. North, it may be remarked in closing, has nothing to say concerning our criticism of the bureau having confounded the "lean" year 1904 with the "fat" year 1905. In the additional information published elsewhere, the 1904 column is again headed 1905 by the bureau, notwithstanding the fact that the figures which appear under the latter year are for the calendar year enrded Dec. 31, 1904. We shall be glad at any time to publish any information Mr. North may care to send us concerning this or other matters.

ADVANCE OF THE BASIC OPEN-HEARTH PROCESS.

In Great Britain it is as in the United States, as regards the relative growth of the acid and basic open-hearth steel processes. Statistics just gathered make the following showing, the figures referring to gross tons of ingots and castings, and covering England, Scotland and Wales:

Total Open-Hearth Steel Production:	
First half, 1905	1,980,095
Second half, 1905	1,899,653
First half, 1906	2,196,853
Acid Open-Hearth Steel Production:	
First half, 1905	1,627,698
Second half, 1905	1,456,812
First half, 1906	1,638,667
Basic Open-Hearth Steel Production:	
First Half, 1905	352,397
Second half, 1905	442,841
First half, 1906	558,186

The production of steel by the acid open-hearth process thus declined from the first to the second half of last year, regaining the lost ground in the first half of this year, with 11,000 tons to spare. The production by the basic process, on the other hand, increased about a hundred thousand tons in each half year, scoring a total gain of more than 200,000 tons from the first half of 1905 to the first half of 1906, while in the same time the acid process gained only one-twentieth as much.

The tendency is unmistakable, but it will take a long time for the British industry to reach the same alignment as prevails in the United States, since we make about fifteen times as much basic open-hearth steel as it does, yet in acid steel it still leads us. Our total make of acid open-hearth steel has declined since 1902; it is true the production of castings has increased, but ingots fell off to a greater amount.

In Great Britain ores should not determine processes to the extent they would in a country using only its own ores, since British furnacemen, in addition to the domestic ores, draw largely from Spain and Sweden and to a less extent from other countries. It is possible to practice the four great processes of steel making in Great Britain, the basic Bessemer, requiring a high phosphorus pig iron, the basic open-hearth, using a pig iron with a moderate phosphorus content, and the acid open-hearth and acid Bessemer processes, using a low phosphorus pig iron. The acid and basic Bessemer processes are about on a par, making between them a couple of million tons of steel last year, while we have seen above the make by the two varieties of the open-hearth process in the first half of this year.

In the United States it is different. There is no pig iron at all suitable for the basic Bessemer process, and it is not used in this country. It has been a matter of choice that the pig iron under the phosphorus limit has gone to swell the acid Bessemer production rather than the acid open-hearth, while it has been a case of necessity that the make of basic open-hearth steel has so greatly increased, since this process uses ores which could not be utilized by any other.

Basic open-hearth steel has made its way in the United States despite opposition in some quarters. It has proved its value, as compared with acid open-hearth steel, and if it had not been able to meet that competition, it would have increased, and perhaps just as rapidly, since instead of its yielding, the acid Bessemer process would have had to yield to the acid open-hearth, and the latter would have grown at the expense of the Bessemer process.

The value of basic open-hearth steel has been too well established, in very recent years, to require the need of further argument. It is interesting, nevertheless, to note that Great Britain, with her greater latitude in the matter of ores, is, although with somewhat humble beginnings, increasing the make of basic open-hearth steel so markedly.

Machine Tool Builders. — The annual meeting of the National Machine Tool Builders' Association is to be held at New York, Oct. 9 and 10, instead of a week later, as has been announced.

THREATS OR VIOLENCE

Barred by Courts in Milwaukee Strike Decision.—Injunction Granted.

The strike of the molders in the Milwaukee machinery manufacturing plants has awakened renewed attention as the result of the appeal to the courts considered by the employers to be necessary again. The Rev. Enoch Perry, of the Wesley M. E. church, in a sermon Sunday, expressed his disapproval of the strike and the methods pursued by the men in attempting to compel the employers to accede to their demands. He said that the closed shop idea was un-American, and referred to the fact that for months employes of the companies had been compelled to remain in barracks and behind pickets because they feared violence if they tried to join their wives and families at their homes.

The following day Judge J. V. Quarles, of the federal court, granted a preliminary injunction, asked for by the Allis-Chalmers Co., to prevent boycott and violence against the molders. Hundreds of affidavits had been submitted to the court by the two sides to the controversy. A feature of the judge's remarks at the time of handing down his decision was the suggestion that the pickets be distinguished by some kind of badge, so that everyone might know who was a representative of the unions.

"The strike," said the judge, "has become more bitter, the plants have been picketed night and day, and the conditions have become hostile in character. It appears that a large number of men have been assaulted by someone. There is one singular feature of the contest. There is no principle of law involved. The defendants do not claim the right to do any of the things we are asked to enjoin. Not a law book has been read at this hearing. The propositions of law involved, however, have been jotted down by the court. They are, in part:

When the defendants went out on strike their relations with the company were at an end. They ceased to be employed. Their places in the shops were no longer theirs except by mutual agreement.

None of the defendants were compelled to do further work.

The company was not compelled to employ those who went out on strike.

The company has the right to employ others to take the places of the strikers and the strikers need not to have been consulted.

The defendants have the right to discuss and argue in a peaceable way with the employes of the company. They had no right to use violence or threats. Persuasion by force of numbers amounts to intimidation. No man should be harassed because he wishes to work.

The defendants have no right by a strike or other hostile method, to interfere with the business of the company. Such a boycott is indefensible in the sight of the law.

"The court feels it incumbent upon itself to reach out and prevent that which seems to have come about. Too many men have been employed as pickets. Persuasion comes when man talks to man; power when, for instance, five are on one side and one on the other. Then the discussion can no longer be peaceable. Until God changes man it will be so."

Pittsburg and Sunday Labor.

Three petitions signed by something less than two hundred business men of the South Side, Pittsburg, Pa., have been presented to Mayor Guthrie, urging that he stop Sunday labor in the mills of the section. The petitions assert "that thousands of iron and steel workers are compelled to labor on Sundays to increase the output and profit. Such shameless disregard of the laws of God and our country, of employers compelling their employes to labor on Sunday has a tendency to degeneracy, to a disregard for law and order, and invites and breeds socialism and anachy."

About Youngstown.

The only change in the molders' strike during the past fortnight has been the signing of the wage scale for journeymen by the Youngstown Car Mfg. Co., employing about 15 molders and a few coremakers. The standard rate demanded, $3.30 for molders and $3.05 for coremakers, was agreed upon. Other foundrymen say that the action of the car works has no bearing whatever on the situation, as the firm, like the Republic Iron & Steel Co. and the Youngstown Furnace & Supply Co., uses all of its own castings.

Work of the N. F. A.

The National Founders' Association states that since last May, when about 7,000 molders went on strike, 114 shops which had been operated under closed-shop conditions, have been made open shops. More than 3,000 men have been instructed in the art of molding, and many of them have become very proficient. More than 1,000 molding machines have been successfully introduced on work which hitherto has only been done by skilled molders.

BIG GAIN IN ORE SHIPMENTS.

Duluth, Sept. 24, 1906.—The movement of ore during the week of Sept. 14-21 was characterized by large gains over last year, and unless a large falling off develops in the next two months, a circumstance of which there is no reasonable probability, a total shipment of 36,500,000 tons for the season is easily assured, for already the Minnesota mines have made a gain of more than 2,000,000 tons. The loading of ore from the No. 4 dock at Duluth was inaugurated during the past week when the steamer A. B. Wolvin took part of her cargo there. The lack of incandescent lights in the pockets has prohibited night work, and the real use of the new dock up to this time, but beginning with tonight it will be used steadily. Something in the way of record loading will probably be attempted in the near future.

The shipment figures for the seven days from Sept. 14 to Sept. 21, are as follows: Two Harbors, 271,682 tons; Duluth, 470,121 tons, and Superior, 196,770 tons, a total for the week of 938,573 tons. The comparative statement for the same period last year was Two Harbors, 228,507 tons; Duluth, 236,941 tons, and Superior, 162,791 tons, an aggregate of 628,239 tons. This indicates a gain for the week this year of 310,334 tons. The total shipment from the northern ranges for the year to date is 17,833,601 tons, against 15,737,456 tons last year, a gain of 2,096,145 tons. The season shipment last year was 34,353,456 tons. If the present rate is maintained and the lower ranges do not fall back too seriously, it will be seen that the statement above is very probable.

DETROIT TUNNEL PLANS APPROVED.

Toronto, Canada, Sept. 22.—The plans of the Detroit River Tunnel Co. have been approved by the Dominion railway commission. The project, the estimated cost of which is between seven and ten million dollars, provides for the construction of two parallel tubes of iron, resting 65 feet below the surface of the water on concrete beds and flanked by concrete walls, giving double tracks to enable the Michigan Central and Canada Southern trains to cross. The tunnel proper will be 20 feet in diameter and the length of the portion under the river 2,625 feet. On the east side there will be an approach of 3,200 feet of tunneling and 3,500 feet half-tunneling, and on the west 2,135 feet tunneling and 1,540 feet of half-tunnel. The iron tubes will be sunk in sections and then riveted together and pumped out. The work will be commenced immediately.

PERSONALS.

F. B. Richards, of M. A. Hanna & Co., Cleveland, O., has returned from a European trip of several weeks.

L. O. Smith, secretary of the Bessemer Foundry & Machine Co., Birmingham, Ala., is spending several weeks in San Francisco.

W. T. Graham, president of the American Can Co., has been elected an additional member of the directory board of that corporation.

W. D. Forsythe, formerly sales manager for the A. Garrison Foundry Co., of Pittsburg, is now with the Trussed Concrete Steel Co., Youngstown, O.

D. R. Hanna, of M. A. Hanna & Co., is to be honored by giving his name to the new 10,000-ton freighter building at Lorain, O., for C. L. Hutchinson.

W. T. Palmer, who recently resigned as foundry man for the Tennessee Coal, Iron & Railroad Co., has decided to continue in that capacity, and will remain at Ensley, Ala.

George W. Fleming, until recently with the Williamsport Supply Co., Williamsport, Pa., has been engaged by the Vandyke Churchill Co., and is connected with its Pittsburg branch in the Farmers' Bank building.

W. L. Williamson, of Muncy, Pa., who has recently been in Missouri examining iron, lead and zinc properties, has been appointed superintendent of mines for the Franklin Iron Manufacturing Co., Clinton, N. Y.

Thomas James, for many years master mechanic of the Edgar Thomson plant of the Carnegie Steel Co., and who recently retired on a pension, was presented last week with a handsome Masonic emblem and chain by his former associates.

William B. Schiller, president of the National Tube Co., sustained a fractured leg and other severe injuries Sept. 22. He was driving near his country home at Sewickley, Pa., when the horse became frightened and ran away, overturning the vehicle.

William H. Foster, secretary of the H. C. Chase Foundry Co., Chicago, Ill., was badly injured by a street car in that city Sept. 23. He suffered a fracture of the leg and several scalp wounds, lying unconscious for some time before being found, but he will recover.

George W. Jackson, until recently chief engineer and general manager of the construction department of the Illinois Tunnel Co., after a tour abroad, is to act as consulting engineer for several railroad companies and to direct affairs of three corporations, of which he is president, the Jackson & Corbett Steel & Iron Co., the Jackson & Corbett Co. and the Jackson Steel Sheeting Co.

OBITUARY.

William E. Eagleton, manager of the American Steel & Wire Co., fell dead at the dinner hour in a New York cafe, Sept. 20.

Charles R. Vandercook, who established the first stove foundry in Chicago, was run down and killed by a train, Sept. 21. He was 87 years of age.

Peter Schuttler, a pioneer wagon manufacturer of Chicago, died recently in Langenschwalbach, Germany, after spending the summer abroad.

Daniel C. George, a leading resident of Latrobe, Pa., died Sept. 17, at the age of 70. He organized and operated the plant of the Ridgeview Coal & Coke Co.

Benjamin F. Hetherington, president of the Hetherington & Berner Iron Works Co., died at Indianapolis, Ind., Sept. 16, at the age of 77. He was a native of England.

William V. Callery, one of the younger business men of Pittsburg, died Sept. 17, in that city, aged 41. He was an officer or leading stockholder in a number of corporations, being president of the Union Bridge Co. and of the Thirtieth Street Bridge Co.

John Mullin, a pioneer iron manufacturer of Pittsburg, died recently at his home in Detroit, Mich. He was a native of Ireland and came to this country in the early 30's, first entering the scrap iron business and later the rolling mill field. He was at one time owner of the James Wood Rolling Mill at Pittsburg.

James Stewart, founder of the firm of James Stewart & Co., scrap iron and metals, Boston, Mass., died Sept. 11 at the age of 78. He was a native of Scotland and came to this country when 19 years old. During the Civil War he worked for the South Boston Iron Co., making guns. He leaves a son, Frederick J. Stewart.

George W. Robertson, president of the Southard-Robertson Co., stove manufacturer, died at Peekskill, N. Y., Sept. 17 from paralysis. He was born in New York City, Oct. 19, 1838, and was educated at the Peekskill Military Academy and the Charlotte University. He had been a member of the New York legislature, filling one term in the assembly and another in the senate. He leaves two daughters and one son.

Edward Worthington, a recognized mining expert, died at the residence of his son in Pittsburg, Sept. 18, at the age of 93. He was born in North Wales, coming to America in 1851 and associating himself with the Bradys Bend Iron Co., Bradys Bend, Armstrong county, Pa. He retired from business about 25 years ago.

John E. Fry, a pioneer of distinction, died recently at Johnstown, Pa., aged 69. He was for many years connected with the Cambria Iron Co., and also served as manager of the open-hearth department of the Springfield Iron Co., Springfield, Ill., of the converter department of the Wheeling Iron & Steel Co. and of the plant of Atkins Bros., at Pottsville, Pa. He developed some processes of great value in connection with the Bessemer process.

Thomas Edward Hambleton, one of Maryland's leading financiers, and active in the organization of many transportation lines, died in Baltimore Sept. 21, at the age of 77

James A. Burden, formerly president of the Burden Iron Co., Troy, N. Y., died Sept. 23, at his home in New York city. He was born in Troy, N. Y., in 1833 and was the son of an iron manufacturer and inventor. He attended the Sheffield Scientific School and the Rensselaer Polytechnic Institute, entering his father's iron works at Troy upon graduation. He rose step by step until he became head of this concern as well as of the Hudson River Ore & Iron Co., but resigned both positions some time ago on account of failing health. He continued as vice president and a trustee of the Burden Iron Co., vice president and a director of the Eastern Steel Co., a director of the Port Henry Iron Co. and a number of other concerns. He obtained patents on almost a score of inventions connected with the iron trade.

Philip F. Kobbe, vice president and treasurer of the Westinghouse Electric Mfg. Co., died at his country place, Hillfield, in Stockbridge, Mass., Sept. 21. He was born in New York in 1842 and was educated in Germany. He served during the Civil War as a member of the Seventh regiment. The United States Lighting Co. with which he was connected, was absorbed by the Westinghouse company in 1890, when he was elected vice

president and treasurer of the corporation. He was a director in the Westinghouse American, British and French companies and was interested in other Westinghouse companies.

William J. Howells, formerly of Wheeling, W. Va., and Martins Ferry, O., died at his country home near Ravenna, O., Sept. 23. Mr. Howells was born in Wales in 1840, and came to America when he was 17 years old. His first work was in the Harrisburg shops of the Pennsylvania railroad, where he learned the machinists' trade. In 1870 he went to Wheeling and became chief engineer of the Riverside Iron Works, and from there went to the Whitaker Works, Wheeling. He resigned to accept the position of master mechanic of what is now the Aetna-Standard plant of the American Sheet & Tin Plate Co., which position he held for 25 years, retiring in 1897.

HEAVY CAR ORDERS.

New York, Sept. 25.—Several hundred thousand tons of steel plates will be required in the construction of rolling stock for which contracts have been placed within the past few days. The Pennsylvania railroad ordered 12,400 cars last week, and others are under negotiation. Of the cars ordered the Pressed Steel Car Co. will build 4,000 hopper cars, 2,000 gondola cars, 900 box cars and 400 flat cars; the Cambria Steel Co., 3,000 hopper cars, and the Standard Steel Car Co., 2,100 gondola cars. The New York Central railroad ordered about 17,000 cars in all. Of these the American Car & Foundry Co. will furnish 2,050 40-ton steel under-frame flat cars, 3,000 50-ton steel trip hopper gondola cars, and 2,000 40-ton box cars; the Pullman Co., 4,000 40-ton box cars; the Standard Steel Car Co., 1,370 50-ton steel hopper cars, and 3,000 50-ton steel trip hopper gondola cars; the Barney & Smith Car Co., 1,000 50-ton steel trip hopper gondola cars; and the Rodgers Convertible Ballast Car Co., 650 cars. The Harriman lines have also ordered 6,000 refrigerator cars and nearly 200 locomotives.

New business in steel rails of the last few days besides the allotment of 80,000 tons for the New York Central lines, the actual sale of which had been mentioned some weeks ago, included an order for 4,000 tons for the Milwaukee Electric Railway & Lighting Co., and 5,000 tons in miscellaneous sales.

HEAVY CAR AND LOCOMOTIVE ORDERS PLACED.

Large orders have been booked by car and locomotive building concerns during the past ten days.

The American Car & Foundry Co., among others, has secured the following contracts: Colorado Southern, New Orleans & Pacific, 500 box, 250 flats, 200 ballast and 75 oil tanks, all with steel underframe; Delaware & Hudson, 400 flats, 100 produce cars and 20 refrigerator cars; Salem, Falls City & Western, 18 flats; Elgin, Joliet & Eastern, 50 steel dump cars and 150 steel underframe gondolas; Chicago, Lake Shore & Eastern, 175 steel dump cars and 300 steel underframe gondolas.

The Pressed Steel Car Co. has taken orders for 100 steel ore cars and 250 gondolas for the El Paso & Southwestern. The Standard Steel Car Co. is to build 1,000 box cars for the Central Railroad of New Jersey, 500 steel hoppers for the Bessemer & Lake Erie and 100 box cars for the El Paso & Southwestern. The Pullman Co. has taken orders for about 45 coaches of various kinds, including 14 for the Mexican Central and 20 for the Colorado Southern, New Orleans and Pacific.

The Northern Pacific, Great Northern and New York Central are expected to be in the market for equipment shortly, the Seaboard Air Line is negotiating for 100 gondolas and 500 box cars, the Erie is soon to inquire for about 1,000 box cars and 200 coal cars, the Northern Pacific is asking prices on 1,000 flats, the Georgia Coast & Piedmont is in the market for freight equipment, the Chicago, Rock Island & Pacific is receiving prices on a miscellaneous assortment of about 4,000 cars in addition to a number of coaches, and the Chesapeake & Ohio for 400 box cars and 350 of miscellaneous kinds.

The American Locomotive Co. is to build two locomotives for the Bangor & Aroostook; eight for the Elgin, Joliet & Eastern; seven for the Chicago, Lake Shore & Eastern; two for the Denver, Northwestern & Pacific; eight for the Colorado Southern, and one each for a number of lines. The Baldwin Locomotive Works is to construct 25 for the Louisville & Nashville; three for the Georgia Coast & Piedmont; ten additional for the Mobile & Ohio; eight for the Georgia, Florida & Alabama, and 26 for the Colorado Southern.

The Chicago, Rock Island & Pacific is in the market for 50 locomotives of various types; the New York Central is reported as soon to order 200 additional, and the Delaware & Hudson is asking prices on 20.

W. R. Barnhart, of Greensburg, Pa., has sold the coal underlying his farm to the Jamison Coal & Coke Co. and the Keystone Coal & Coke Co., the consideration being about $250,000.

TIDEWATER FURNACE LEASED.

The Tidewater Sheet Co., which has leased its blast furnace to the Maryland Steel Co., has also arranged for the operation of its 40 Semet-Solvay coke ovens by the Suburban Gas Co. Eventually it is expected that all the departments will be disposed of to various interests. The annual meeting was held at Chester on Sept. 18, when the following directors were elected for the ensuing year: E. R. Dick, J. H. Moody, Joseph Gilfillan, George McCall, Charles A. Porter, Charles P. Schoen, Frank Samuel, Charles E. Stafford and F. F. Hovey. The board of directors was reorganized as follows: president, C. E. Stafford; secretary and treasurer, Frank Dreizler.

The American Bridge Co. has secured a contract for a bridge over the Allegheny river at Franklin, Pa. It will cost $10,000.

SUNDAY WORK ABOLISHED.

The McClintic-Marshall Construction Co., with its plants at Rankin and Pottstown, Pa., has taken the initiative in abolishing Sunday work in its establishment. The following notice has been posted in the shops:

NOTICE.

"Hereafter no repair work or other work of any description will be done in this plant on Sunday. The plant will shut down at noon every Saturday, and all repair work must be done between noon on Saturday and Saturday midnight. The watchman will not allow any workman to be in the works on Sunday.

(Signed):

McCLINTIC-MARSHALL CONSTRUCTION CO.
Thomas Conley, Superintendent.
H. H. McClintic, V. P. & G. M."

Construction on the new concentrating plant of the Federal Lead Co., at Flat River, Mo., has been tied up by the filing of 125 mechanics' lien suits which have been brought as the result of the disagreement between the contractor and the company. The contractor, the Abbott-Gamble Co., has stopped construction and now the suits tie up the work so that no one else can go ahead with it for the present. The plant will cost $1,500,000 and will be by far the largest in the west.

The Webb City Iron Works, at Webb City, Mo., has nearly completed their new plant which will have a capacity of twice the old one. It will start up about Dec. 1, with 150 men employed.

ELECTRIC FURNACE METHODS OF IRON AND STEEL PRODUCTION.—IV.[1]

BY JOHN B. C. KERSHAW, F. I. C.

The Kjellin Furnace and Process.

This furnace and process are the invention of M. F. A. Kjellin, a Swedish engineer, whose first patent was dated Aug. 1, 1900. The process differs from other electric iron and steel processes in the use of induced currents for heating the iron. By this means, the waste of heat occurring in the Heroult and Keller furnaces and processes, due to the unnecessarily high temperature of the electric arc is avoided, while the expense and disadvantages attending the use of carbon electrodes are also overcome, since in the Kjellin furnace no electrodes are required.

On the other hand the Kjellin furnace is not adapted for dealing with impure materials owing to the comparatively low temperature attained, and the elimination of phosphorus, sulphur and other objectionable elements present in iron ores and in scrap iron, cannot be carried out so completely as in the Heroult and Keller furnaces. Electrical difficulties due to self-induction also reduce the efficiency of the Kjellin furnace and process,—and its superiority to the processes making use of combined arc and resistance heating with carbon electrodes, is less striking than might be expected, the chief gain being in the purity of the product which resembles ordinary crucible steel.

However, furnaces of constantly increasing size, operated upon the Kjellin principle of using the molten iron as the resistance for induced currents of electricity, have been working at Gysinge in Sweden since 1900, and similar furnaces are now in course of erection in many countries. The fact that Messrs. Siemens & Halske, of Berlin, have purchased the patent rights of the furnace and process for Germany and Austria, and that Messrs. Krupp are now erecting a Kjellin furnace plant for production of crucible steel at Essen, also proves that the Kjellin furnace and process is one that has achieved a permanent position in the iron and steel industry.

Fig. 1, shows the exterior of the Gysinge works, in Sweden, and Figs. 2 and 3 are respectively a sectional elevation and a plan of the furnace erected there in 1901-1902. The following is a description of this furnace in the inventor's own words: "An annular groove B B forms the furnace room, the sides and bottom of which consist of refractory bricks. In the center of the circle formed by the furnace room, is a quadrangular core or cone C, formed of thin insulated copper wire, which continues outside the furnace, and forms with the furnace room, the two links of a chain. The coil A is connected with the poles of an alternating current generator. When passing through the coil, the current excites a varying magnetic flux in the core or cone C, and the intensity of the current in the steel is then almost the same as the primary current multiplied by the turns of wire in the primary coil. The tension of the current is naturally reduced, in almost the same ratio as the intensity is increased. In this way it is possible to use an alternating current generator of high tension, and yet, without using transformers with copper cables of large sections and process and costly electrodes, to obtain a current of low voltage and great intensity in the furnace."

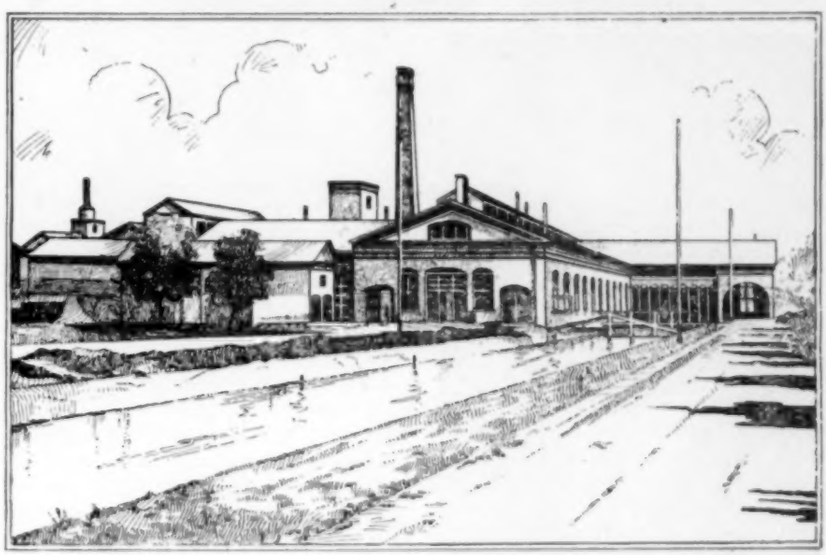


FIG. 1.—EXTERIOR OF GYSINGE WORKS IN SWEDEN.

The first runs with the experimental furnace were made at Gysinge in March, 1900, 270 kilograms (595 pounds) of steel of excellent quality being produced in 24 hours with an expenditure of 78 kilowatts of electrical energy. This was equal to 6,912 kilowatt-hours per metric ton of steel. In order to improve the efficiency of the process a larger furnace was erected, and in November of the same year, trial runs with this furnace yielded 600-700 kilograms (1,323-1,543 pounds) of steel per 24 hours with an expenditure of 58 kilowatts,—equivalent to 2,141 kilowatt-hours—per metric ton of steel. This was an improvement, but the inventor was convinced that with a larger furnace, still better results could be achieved.

In August, 1901, the sulphite wood pulp mill at Gysinge was destroyed by fire, and the owners decided to devote the whole of the water power at this place to steel manufacture, in place of erecting a new wood pulp mill. A larger Kjellin type of furnace, capable of containing 1,800 kilograms (3,970 pounds) of steel was erected, and this commenced work in May, 1902. This furnace produces 4,100 kilograms (8,840 pounds) of steel ingots per 24 hours, with an expenditure of 165 kilowatts, and a current approaching 30,000 amperes in the secondary circuit. The energy consumption is therefore 965 kilowatt-hours per metric ton of steel. Only 800 to 1,000 kilograms (1,764-2,204 pounds) of metal are poured at each casting, the remainder being left in to act as conductor for the current and to avoid stopping the turbine or alternator. To this molten metal left in the furnace, the proper quantity of pig iron, and steel scrap are added to form the new charge, the proportion being calculated to yield steel of the desired composition. There is always less carbon in the finished steel than is contained in the charged material, but rather more silicon—owing to the fact that the rust or oxide of iron in the pig and scrap is reduced to metallic iron, and that the silicic acid of the furnace lining is also reduced by the carbon present in the charge.

[1]The preceding articles of this series were published in the IRON TRADE REVIEW on June 28, July 26 and Aug. 30.

The tapping of the furnace was originally effected by making a hole in the wall, but a tilting furnace has since been constructed, and the casting charge is now poured.

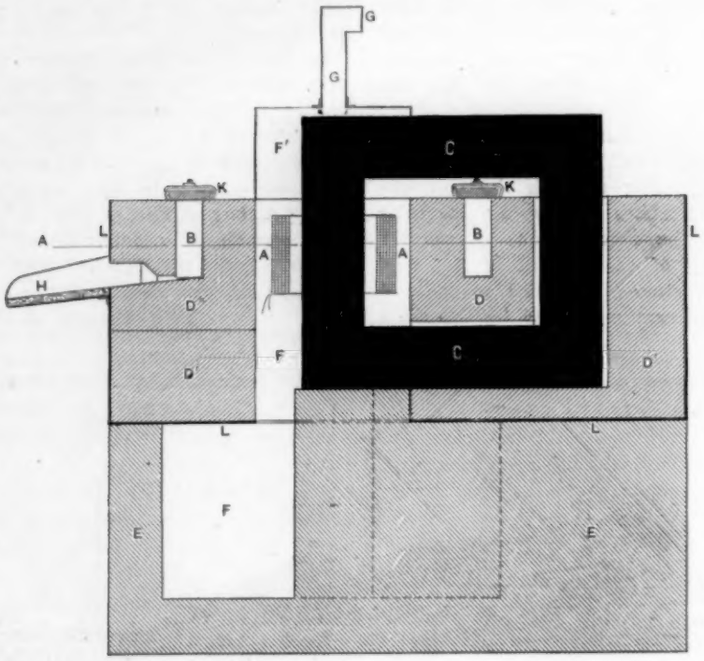


FIG. 2.—SECTIONAL ELEVATION OF KJELLIN FURNACE.

The charging of the raw material is done from the working floor above the furnace the covers shown in Fig. 2 at K K being taken off, and the pig iron and scrap steel being placed in the annular ring. Fig. 4 is a view of the furnace being charged.

The furnace described above has been in operation at Gysinge since May, 1902, and in February, 1903, it was visited by the Canadian experts and seen by them in operation. An alternating current of 90 amperes at 3,000 volts was supplied to the primary circuit of the furnace, this being transformed in the charge of molten metal contained in the annular ring, to a current of 3,000 amperes at seven volts.

The air space—F F F in Fig. 2 was found to keep down the temperature of the primary coil, and in addition to the cooling produced by this draft of air, water could also be employed for this purpose. The loss of heat by radiation, etc., when the temperature of the furnace is 1,400 degrees Cent., was estimated by the inventor to equal 80 kilowatts, and the efficiency of the furnace was calculated by him to be 45.5 per cent. The temperature of the steel when tapped was 1,600-1,700 degrees Cent.

It may be remarked that the figures given on pages 2 and 3, of the Canadian Commissioners' Report, do not agree with these calculations—since the discrepancy between the energy in the primary and secondary circuits of the furnace, amounts to 270 — 21 = 249 kilowatts.

Assuming that the current in the secondary circuit was 30,000 amperes and not 3,000 amperes as stated in the report, the losses between the two circuits are 270 — 210 = 60 kilowatts.

Three runs were made with the furnace in the presence of the commissioners at Gysinge on Feb. 8 and 9, 1904, and the following figures were obtained:

Charge.	Time-hours	Ingots.	Total kilo-watt-hours.
546	6	1030 kg. / 2271 lb.	857
547	6 2-3	955 kg. / 2105 lb.	994

The power consumption in the first case was therefore 832 kilowatt-hours per metric ton of ingots, and in the second case 1,040 kilowatt-hours.

The steel produced in these runs was found to have the following composition:

Charge	C	Si	S	P
546	1.082	0.194	0.008	0.010
547	0.417	0.145	0.008	0.010

The raw materials in each case were best Swedish pig iron and Walloon bar iron, with scrap steel from previous charges, the proportions of these being varied according to the type of steel required for casting.

Attempts to produce a low carbon soft steel were made by the Canadian commissioners, but owing to unexpected difficulties, they were not successful.

The cost of producing steel by this process was estimated by Mr. Har-

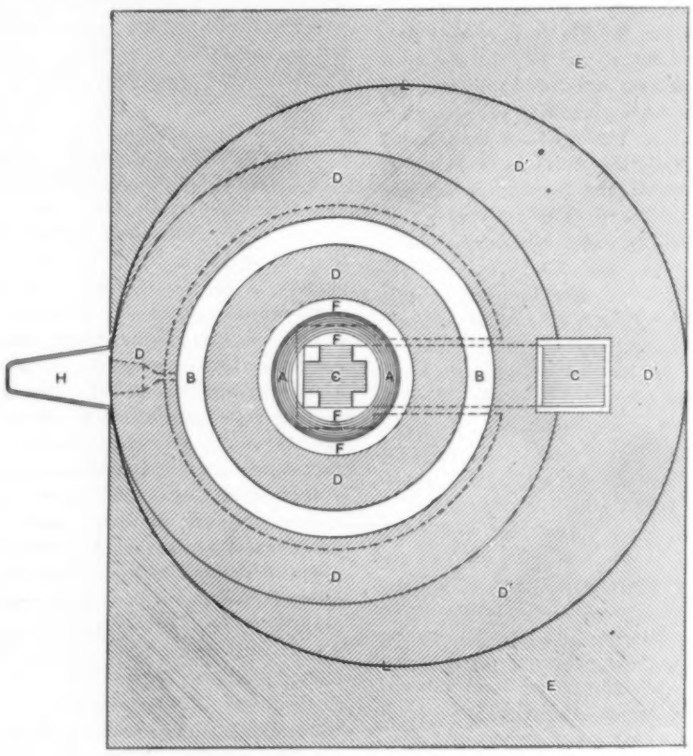


FIG. 3.—PLAN OF KJELLIN FURNACE.

bord to be $34.00 per ton of 2,000 pounds, with electric energy at $10.00 per electrical horsepower-year.

The cost of erecting a furnace of the Kjellin type of 600 horsepower capacity was stated to be about $4,000.

The Swedish patents for the Kjellin furnace and process are owned by the Metallurgiske Patent Aktiebolaget, of Stockholm, and licenses have been granted by this company to the new owners of the Gysinge works, to a prominent English steel works, to a French firm at Voiron, and to a Swiss calcium carbide company with works at Gurtnellan. A small experimental furnace erected at the latter place has worked satisfactorily, and it is now intended to erect larger furnaces and plant. The patent rights of the Kjellin furnace for Germany and Austria have been sold to Messrs. Siemens & Halske, and Messrs. Krupp have arranged to erect and work a furnace of this type—under license from the Berlin firm.

A project is also under discussion in Stockholm for the development of the Tralhatta waterfall in the province of Norrland, where extensive deposits of iron ore are found, and for the use of the electric energy for creation of an iron and steel industry with the aid of the Kjellin furnace and process. The project covers the transmission of the power from the falls to a point near Gothenburg, where a steel works producing 500,000 tons annually, will be erected by the Stockholm company owning the Kjellin patents. The Swedish government is reported to have given its sanction to this scheme, and to have agreed to develop the Tralhatta waterfall. It is expected that 10,000 to 15,000 horsepower will be available for this new iron and steel center, early in the year 1908.

An experimental Kjellin furnace has also been installed in the metallurgical department of Sheffield university, the home of the English steel industry.

The costs of production by, and general prospects of the Kjellin furnace and process will be discussed in Article VII of this series.

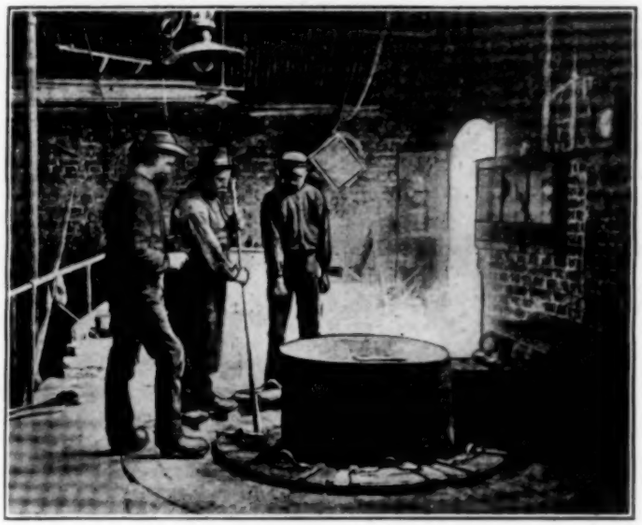


FIG. 4.—CHARGING THE KJELLIN FURNACE.

CORPORATION PLACES LARGE TUBE MILL ORDER.

The United States Steel Corporation has ordered from the Power & Mining Machinery Co., Cudahy, Wis., forty-seven tube mills five feet in diameter and twenty-two feet in length, twenty of them to be installed in the plant of the Carnegie Steel Co., at Homestead, Pa., and twenty-seven for the extension of the plant cement plant operated by the Illinois Steel Co. at Buffington, Ind. The marvelous development in this line of activity, indicated by the output of Portland cement, which was 42,000 barrels in 1880, and 35,000,000 barrels in 1905, will be taken advantage of to the fullest possible extent by Milwaukee manufacturing plants. The situation with respect to the cement and reinforced concrete business was indicated in Milwaukee a few days ago by a statement of Secretary-Treasurer Beebe of the Wisconsin Hardwood Lumbermen's Association when he remarked that in his opinion there would be no more lumber available in twenty-five years for exterior house building, or in any event not sufficient for practical purposes.

MILWAUKEE ENGINEERS PLAN WINTER'S WORK.

The Milwaukee Engineers' Society, made up of the leading engineers of that Wisconsin city, principally shop men, has entered upon a new year with C. J. Davidson, chief engineer of the Milwaukee Electric Railway & Light Co. and its affiliated lines, as chief executive officer. He was elected at the annual meeting Sept. 19. The other officers include S. L. G. Knox of the Bucyrus Steam Shovel & Dredge Co., who has done a great deal of work for the introduction of this company's dredges upon the Panama canal. He is vice president. W. G. Starkweather of the Allis-Chalmers Co., has been re-elected secretary and treasurer. E. P. Worden is treasurer, and Thomas Capen, R. W. Grace and R. E. Newton directors. The society numbers among its members some men well known in engineering circles of the country, especially in the machinery field. It will admit to membership engineers in all fields, and hopes to do a great deal of educational work in the coming winter. The plan will be to continue the series of lectures which proved popular last winter.

PRESIDENT C. J. DAVIDSON.

Mr. Davidson's election as president, aside from other circumstances surrounding it, is interesting because he is not a university man, but rose to his present position through the shop and engine room.

The population of the United States Sept. 1 was estimated by the treasury department at 84,897,000, and the money in circulation per capita at $32.59.

Additional Census Statistics for Rolled Iron and Steel.

At the request of the Hon. S. N. D. North, director of the census, we take pleasure in giving below some additional details concerning the production and value of steel ingots and castings and finished rolled iron and steel in the United States during the census year which ended Dec. 31, 1904. These details were sent to us by the director as a result of our recent criticism of the methods adopted by the census bureau in grouping some of the products in its preliminary report on rolled iron and steel.

Merchant Bars.—The production of all kinds of iron and steel merchant bars in this country in 1904, according to the bureau, amounted to 2,442,810 tons, as compared with 2,493,159 tons in 1900, a decrease of 50,349 tons. The value of the bars rolled in 1904 amounted to $84,069,122, or $34.41 per ton, as compared with $100,597,221 in 1900, or $40.35 per ton. In 1890 the average price per ton was $43.61, and in 1880 it was $64.86 per ton.

Wire Rods.—The production of wire rods, according to the bureau, amounted to 1,792,704 tons in 1904, as compared with 916,587 tons in 1900, an increase of 876,117 tons, or over 95 per cent. The wire rods rolled in 1904 were valued at $52,995,031, as compared with $35,529,529 in 1900. The average value per ton in 1904 was $29.55, as compared with $38.76 per ton in 1900. Statistics of the production of wire rods were not separately collected by the census bureau in 1890 or 1880.

Direct Steel Castings.—The census bureau reports the total production of all kinds of steel castings in 1904 as amounting to 287,325 tons, as compared with 177,156 tons in 1900, an increase of 110,169 tons, or over 62 per cent. The value of the castings in 1904 was $20,600,136, as compared with $14,609,893 in 1900. The average value per ton of the castings made in 1904 was $72.04, as compared with $82.47 in 1900. Statistics of the production of steel castings were not separately collected by the bureau in 1890 or 1880.

Bessemer Steel Castings.—Dividing the output, of steel castings by processes, the bureau reports a production of Bessemer steel castings in 1904 of 31,653 tons, as compared with 3,761 tons in 1900, an increase of 27,892 tons. The value of the Bessemer castings made in 1904 was $2,369,036, against $322,465 in 1900. The average value per ton in 1904 was $74.84; in 1900 it was $85.74 per ton.

All Kinds of Open-Hearth Castings.—The production of acid and basic open-hearth steel castings amounted in 1904 to 251,561 tons, as compared with 165,529 tons in 1900, an increase of 86,032 tons. In 1904 these castings were valued at $17,789,146, as compared with $13,004,591 in 1900. The average value per ton in 1904 was $70.71, as compared with $78.56 in 1900. Of the total open-hearth castings produced in 1904 164,330 tons were made by the acid process, against 129,005 tons in 1900, an increase of 35,325 tons, and 87,231 tons by the basic process, against 36,524 tons in 1900, an increase of 50,707 tons. The acid open-hearth castings were valued at $12,193,058 in 1904, or $74.19 per ton, against $10,376,344 in 1900, or $80.43 per ton, while the basic open-hearth castings were valued at $5,596,088 in 1904, or $64.15 per ton, against $2,628,247 in 1900, or $71.96 per ton.

Crucible and Miscellaneous Steel Castings.—The production of steel castings by the crucible process and by special processes (McHaffie, Hadfield, etc.), amounted in 1904 to 4,111 tons, as compared with 7,866 tons in 1900, a decrease of 3,755 tons. The value of these castings in 1904 was $441,954, or an average of $107.50 per ton, as compared with $1,282,837 in 1900, or $163.08 per ton. Of the 4,111 tons reported for 1904, 3,680 tons were made by the crucible process, against 3,643 tons in 1900, an increase of only 37 tons, and 431 tons were made by the McHaffie, Hadfield, and other special processes, against 4,223 tons in 1900, a decrease of 3,792 tons. The crucible steel castings made in 1904 were valued at $370,097, or $100.57 per ton, as compared with $486,488 in 1900, or $133.53 per ton, while the steel castings made by miscellaneous processes in 1904 were valued at $71,857, or $166.72 per ton, against $796,389 in 1900, or $188.58 per ton.

Steel Ingots Produced For Sale.—There were 196,404 tons of steel ingots produced for sale in 1904, as compared with 103,707 tons in 1900. In 1904 these ingots were valued at $3,985,310, or $20.29 per ton, as compared with a value in 1900 of $2,781,145, or $26.81 per ton.

If the 1904 statistics given above by the census bureau for wire rods and steel casting are compared with statistics for the same products and for the same year collected by the American Iron and Steel Association some rather astonishing differences are shown, as will be seen by reference to the following comparative statement:

Products, Gross tons.	Census.	Association.	Difference.
Wire rods .	1,792,704	1,699,028	93,676
Total castings	287,325	330,211	42,886
Bessemer ..	31,653	16,051	15,602
Open-Hearth	251,561	302,834	51,273
Acid	164,330	203,915	39,585
Basic	87,231	98,919	11,688
Crucible and Misc.	4,111	11,326	7,215
Crucible ...	3,680	4,308	628
Miscellaneous	431	7,018	6,587

The association did not collect separately for 1904 the production of merchant bars and rods, and it is not possible, therefore, to include them in the above statement. Neither can the production of steel ingots for sale be included, as the association does not separate in its statistics the output of ingots turned out for sale from those made by steel makers for their own consumption.

Wire Rods.—The difference between the figures collected by the census bureau and those collected by the association for this product while considerable, is not startling, as it amounts to but a little over 5½ per cent. It may be caused by the inclusion in the census figures of small quantities of merchant rods, as the output of merchant bars reported by the bureau for 1904 is remarkably small, being slightly less than the production it reported for 1900. According to the association the output of merchant bars in 1905, one year later than the period covered by the census bureau, was 3,593,601 tons, an increase of 1,150,791 tons over the quantity reported by the bureau for 1904.

Total Direct Castings.—The preliminary figures issued by the census bureau for all kinds of steel castings differ materially from those of the association, the latter being 42,886 tons, or almost 15 per cent, larger than the former. This is a surprising difference when the comparatively small tonnage reported for the whole steel casting industry is considered. Before printing the final report it might be well for the census bureau to compare notes with the association for the steel casting industry.

Bessemer Steel Castings.—Comparing the Bessemer steel castings reported by the two organizations a difference of almost 100 per cent is shown. That over 31,600 tons of castings by

the Bessemer process and its various modifications were produced in this country in 1904 is almost incredible. According to the association's figures the banner year, prior to 1905, was 1903, when 18,099 tons were turned out. Prior to 1903 the largest output was in 1902—12,548 tons. As is well known, 1904 was a year of reaction in the steel trade. As compared with 1903 the production of Bessemer steel ingots and castings fell off some 733,000 tons. The probabilities are therefore in favor of the association's figures being correct.

Open-Hearth Steel Castings.—The total for acid and basic open-hearth castings reported by the census bureau is 51,273 tons smaller than the total reported by the association. This is a difference of over 20 per cent. In acid castings the difference amounts to 39,585 tons, or over 24 per cent, and in basic castings to 11,688 tons, or over 13 per cent. It is just possible that these differences are caused by the arbitrary classifications adopted by the census bureau, and that the missing tonnage has been credited to foundry and machine shop products instead of to the open-hearth steel casting industry.

Crucible and Miscellaneous Steel Castings.—The difference between the census and association figures in these branches of the steel casting industry amounts to 7,215 tons, or over 175 per cent. In crucible castings the difference amounts to only 628 tons, but in miscellaneous castings it is astonishing. Certainly more than 431 tons of castings were turned out in 1904 by the McHaffie, Hadfield, Atlas, and other miscellaneous processes. For the sake of its own reputation for accuracy, the census bureau should not allow these figures to be printed in its final report until it is absolutely certain that they are correct. As the number of plants which make steel castings by the McHaffie and other miscellaneous processes is small, it should be a comparatively easy matter for the bureau to verify the figures given above.

Charcoal and Tariffs.—Charcoal is not a "manufacture of wood" as that term is used in the Dingley tariff law, according to the recent decision of the board of general appraisers of the United States. Instead it comes under the classifications of "unenumerated manufactured articles," with assessment at the rate of 20 per cent. This reverses a decision rendered 50 years ago.

UNIFORM NOMENCLATURE OF IRON AND STEEL.

At the Brussels Congress of the International Association for Testing Materials held in September, 1906, committee 24, of which Mr. Henry M. Howe, of New York, was chairman, presented a report on "The Uniform Nomenclature of Iron and Steel." In this report, the following definitions of various forms of iron and steel are given:

Alloy cast irons; those which owe their properties chiefly to the presence of an element (or elements) other than carbon.

Alloy steels; those which owe their properties chiefly to the presence of an element (or elements) other than carbon.

Basic pig iron; in America, pig iron containing so little silicon and sulphur that it is suited for easy conversion into steel by the basic open-hearth process. It is restricted to pig iron containing not more than 1.00 per cent of silicon.

Bessemer pig iron; that which contains so little phosphorus and sulphur that it can be used by itself for conversion into steel by the original or acid Bessemer process. In America, this term is restricted to pig iron containing not more than 0.10 per cent of phosphorus.

Bessemer steel; steel made by the Bessemer process, whether its carbon content is high, low or intermediate.

Blister steel; steel made by carburizing wrought iron by heating it in contact with carbonaceous matter. It might also be made by so carburizing a low-carbon steel.

Cast iron; generically, iron containing so much carbon or its equivalent that it is not malleable at any temperature. Specifically, cast iron in the form of castings other than pigs, or remelted cast iron suitable for casting into such castings, as distinguished from pig iron, i. e., cast iron in pigs, etc. (See pig iron). The committee recommends drawing the line between cast iron and steel at 2.20 per cent carbon for the reason that this appears from the results of Carpenter and Keeling to be the critical percentage of carbon corresponding to the point "a" in the diagrams of Roberts-Austen and Roozeboom. As to the signification of this critical point, the committee is not prepared to express an opinion.

Cast steel; the same as crucible steel; obsolescent, and to be avoided because confusing and because it offers a temptation to fraud.

Cemented steel; the same as blister steel.

Charcoal hearth cast iron; cast iron which has had its silicon and usually its phosphorus removed in the charcoal hearth, but still contains so much carbon as to be distinctly cast iron.

Converted steel; the same as blister steel.

Crucible steel; steel made by the crucible process, whether its carbon content is high, low or intermediate.

Gray pig iron and *gray cast iron;* pig iron and cast iron in the fracture of which the iron itself is nearly or quite concealed by graphite, so that the fracture has the gray color of graphite.

Hematite pig iron; originally pig iron made from the hematite ores of England, which happen to be so free from phosphorus and sulphur that the pig irons made from them can be used by itself for the acid Bessemer process. By association, it has come to mean any pig iron thus relatively free from phosphorus and sulphur. The term is not used in America, and is undesirable.

Hot metal or *direct metal;* the molten cast iron from the blast furnace before it has been allowed to solidify.

Ingot iron; steel cast into an initially malleable mass and containing so little carbon or its equivalent that it does not harden greatly on sudden cooling. The word is rarely used in English, "mild steel" or "low carbon steel" or "soft steel' being generally used in its place. In America, the line between soft steel and half-hard steel is usually drawn at a carbon content of about 0.20 per cent.

Ingot steel; steel cast into an initially malleable mass and containing so much carbon or its equivalent that it hardens greatly on sudden cooling. The word is rarely used in English, but "hard steel," "high-carbon steel" or " half-hard steel" are used in its place.

Malleable castings; castings of malleable cast iron, which see.

Malleable cast iron; iron which when first made is cast in the condition of cast iron, and is made malleable by subsequent treatment without fusion.

Although the English name of this variety suggests that it is cast iron, it is not truly a variety of cast iron, but rather forms an independent species of iron, because it lacks the essential property of cast iron, viz., its extreme brittleness. Though the term "malleable castings" is very common, the term "malleable cast iron" is very rarely used. The common but inexcusable term we regret to say is

"malleable", pronounced "mallable", used as a substantive.

Malleable iron; the same as wrought iron. Used in Great Britain, but not in the United States, except carelessly, as meaning "malleable cast iron" (vulgar "malleable").

Malleable pig iron; an American trade name for the pig iron suitable for converting into malleable castings through the process of melting, treating when molten, casting in a brittle state, and then making malleable without remelting. The term should be used with care to avoid confusion. This material is also called in trade in America "malleable iron", but this use should be avoided, because "malleable iron" has the older and (in Great Britain) firmly established meaning of "wrought iron".

Mottled pig iron and *mottled cast iron*; pig iron and cast iron, the structure of which is mottled, with white parts in which no graphite is seen, and gray parts in which graphite is seen.

Open-hearth steel; steel made by the open-hearth process, whether its carbon content is high, low or intermediate.

Pig iron; cast iron which has been cast into pigs direct from the blast furnace. This name is also applied to molten cast iron which is about to be so cast into pigs or is in a condition in which it could readily be cast into pigs.

Plate iron; a name applied in Great Britain to refined cast iron.

Puddled iron; wrought iron made by the puddling process.

Puddled steel; steel made by the puddling process, and necessarily slag-bearing. (See Weld Steel).

Refined cast iron; cast iron which has had most of its silicon removed in the refinery furnace, but still contains so much carbon as to be distinctly cast iron.

Shear steel; steel, usually in the form of bars, made from blister steel by shearing it into short lengths, piling, and welding these by rolling or hammering them at a welding heat. If this process of shearing, piling, etc., is repeated, the product is called "double shear steel".

Steel; iron which is malleable at least in some one range of temperature, and in addition is either (a) cast into an initially malleable mass; or, (b) is capable of hardening greatly by sudden cooling; or, (c) is both so cast and so capable of hardening. Variety "a" includes also molten iron which if cast would be malleable, as do its two sub-varieties, "ingot-iron" and "ingot-steel". (Tungsten steel is malleable only when red-hot).

Steel cast (adjective); consisting of solid Bessemer, open-hearth, crucible or other slagless steel, and neither forged nor rolled; applied to steel castings. For instance, a "steel cast" gun is a gun which is a steel casting, i. e., which has been neither forged nor rolled. To call it a "cast steel" gun would imply that it was made of crucible steel, to which the term "cast steel" is restricted.

Steel castings; unforged and unrolled castings made of Bessemer, open-hearth, crucible or any other steel. Ingots and pigs are in a sense castings; the term "steel castings" is used in a more restricted sense, excluding ingots and pigs and including only specially shaped castings, such as are generally used without forging or rolling. They may, however, later be forged, e. g., under the drop press, when they cease to be "castings" and become "drop forgings", or, if only part is forged, then they are partly forgings and partly castings.

Washed metal; cast iron from which most of the silicon and phosphorus have been removed by the Bell-Krupp process without removing much of the carbon, so that it still contains enough carbon to be classed as cast iron. The name "washed metal" is extended to cover this product even if its carbon is somewhat below the proper limit for cast iron.

Weld iron; the same as wrought iron. Obsolescent and needless.

Weld steel; iron containing sufficient carbon to be capable of hardening greatly by sudden cooling, and in addition slag-bearing because made by welding together pasty particles of metal in a bath of slag, as in puddling, and not later freed from that slag by melting. The term is rarely used.

White pig iron and *white cast iron;* pig iron and cast iron in the fracture of which little or no graphite is visible, so that their fracture is silvery and white.

Wrought iron, slag-bearing, malleable iron, which does not harden materially when suddenly cooled.

Wrought steel; the same as weld steel. Rarely used.

Names Designating Special Sizes of Shapes of Iron and Steel.

Bar iron; wrought iron in the form of bars, rods, etc.

Muck bar; the rough bars usually one inch thick and about four inches wide, made by the first rolling of a ball of puddled iron.

Merchant bar; wrought iron in the form of merchantable bars or rods made by shearing muck bar into short lengths, piling it and rolling or forging it at a welding heat.

Bloom; 1. A large bar, drawn from an ingot or similar mass, for further manufacture. 2. A rough bar of wrought iron drawn from a Catalan or bloomary ball for further manufacture.

Billet. A small bar drawn from a pile, bloom or ingot for further manufacture. The committee recommends that the line between blooms and billets be drawn at the size of five inches square, as representing common custom.

Slab. A flat piece or plate, with its largest surfaces plane drawn or sheared from an ingot or like mass for further treatment.

The Boundary Between Steel and Iron.

It would be well to decide on a definite carbon content to serve as a boundary line between ingot iron and ingot steel, between puddled iron and puddled steel, and between any other varieties of wrought iron and weld steel. Two plans have been considered. One is to draw this line at 0.32 per cent carbon or its equivalent in other elements, for the reason that this carbon content appears to correspond to the critical point O in the diagrams of Roberts-Austen and Roozeboom. This has the merit of corresponding to a definite physical boundary.

The other plan is to draw the boundary at 0.20 per cent of carbon, because this is a convenient place to separate the important classes "soft steel" and "half hard steel", so that if this point was adopted "ingot iron" would be synomous with "soft steel", and "ingot steel" would be the equivalent of the two classes "half-hard steel" and "hard steel".

Lime Burning in Rotary Kilns. — The Pittsburg Reduction Co. will soon be burning lime in rotary gas-fired kilns. The material is now all on the ground and the erectors at work. The capacity of the plant will be 350 tons in 24 hours. Before deciding on the use of rotary cylinders a trip was made to the New York Lime Co.'s plant at Natural Bridge, N. Y., which is the first plant to successfully burn lime in rotary kilns. The gas producer equipment is being supplied by the Morgan Construction Co., of New York, which reports five successive orders within eight months from the Pittsburg company.

The Johnson Motor Co. will build a new plant at Chester, Pa. The company is a new one and will manufacture gas engines of various kinds.

The Chapin Mine—Its Record and Prospects.

(Special Correspondence.)

Norway, Mich., Sept. 24.—Topped by a fine shafthouse of steel, and braced and wall-plated with the same material, there is probably no more substantial or better built mining shaft in the Lake Superior region than the new "C Ludington" at the United States Steel Corporation's Chapin mine at Iron Mountain the giant of the Menominee range and with the possible exception of the same company's big Norrie, on the Gogebic, the greatest producer of iron ore ever opened in Michigan. Although eventually it will be continued downwards still further, to meet mining needs and underground conditions, this great shaft, sinking for many months, has been bottomed at a depth of 1,500 feet, and for some time past has been receiving its permanent equipment.

The boiler house, in course of erection, is 51 by 69 feet in size. It is a brick-veneered, ironclad structure, and is being provided with a battery of six boilers. These boilers are each of horizontal tubular construction, 18 feet in length and 72 inches in diameter, and will have a total capacity of about 800 horsepower. The big smokestack attached to this boiler house will probably be the largest in the mining region. Constructed of hollow tile, the inside diameter of the great flue is 72 inches, and the stack proper will rise to a height of 135 feet above the foundation. Necessarily, this latter is exceedingly massive, constructed entirely of concrete, 18 x 18 feet on the surface and 10 feet high, giving the chimney a total height of 145 feet.

The Big Cornish Plant.

The big Cornish pumping plant formerly in commission at the abandoned "D" shaft will do duty at the "C Ludington." The Chapin is one of the wettest mines in the entire lake region, making steadily about 3,000 gallons of water a minute. It is proposed to drain the bulk of this flow into the new shaft, which is down 300 feet below the new fourteenth level, and to use the big Cornish pump in forking it to surface. The regular influx of water at the Chapin is not only exceptionally heavy, the limestone formation being favorable to percolation, but at times there are excessive flows to take care of. The shafts at the Chapin are deeper than at many iron mines, and under the most favorable conditions an immense territory must be drained, while occasionally underground reservoirs or water courses are tapped which tax the capacity of the pumping plant to the utmost. Limestone districts are always noted for caverns, undergound streams and generally aqueous conditions. The water finds its way for wonderfully long distances through limestone, and the deeper the shaft the greater the area drained and the more water handled.

The big Cornish pump, built by the E. P. Allis Co., of Milwaukee, was first erected at "D" Chapin when that shaft was sunk a score of years ago. It was supposed at the time that "D" shaft would continue in commission permanently, but it later developed that it had been put down too close to the ore deposit and by reason of the exigencies of mining it was necessary to abandon it a few years ago, the new "C" Ludington being designed to replace the shaft thus lost. The engine is a steeple compound of the crank and flywheel type, and with a steam pressure of 125 pounds at the throttle has a capacity of 3,000 gallons of water a minute from a depth of 1,500 feet. The pump lifts are 200 feet apart, the stroke 120 inches and the column 28 inches in diameter. The pump and piston rods are seven inches in diameter. The diameter of the high pressure cylinder is 50 inches, and the diameter of the low pressure is double that. The high pressure cylinder has one piston rod, the low pressure three cylinders. The plungers are 28 inches in diameter. The height of the engine from top of foundation is 54 feet. The flywheel is 40 feet in diameter, and weighs 160 tons. The foundation for the plant is massive and erected on the ledge, to reach which it was necessary to carry the excavation down 40 feet. In demolishing the stone building formerly housing the big pump it was necessary to resort to the use of dynamite, the cemented joints proving wonderfully stubborn.

The New Shaft.

In selecting the site for the new shaft, the management was guided by the pitch of the ore body, which is to the west. The shaft is well back in the slates of the footwall, insuring its stability and avoiding the troubles met with at several of the old shafts sunk on the Chapin strike before the full proportions of the property were known. It is 600 feet southwest of the old incline shaft known as the "B" Ludington and will be the main avenue through which will come the ores in this portion of the company's possessions. The shaft is vertical, 21¼ by 10 1-3 feet in inside dimensions, and has four compartments, one for the cage, two for skips and the other for pump and ladderway. It is steel-lined throughout, the material consisting of rail and "I" beams, with sets four feet apart. At a depth of 1,200 feet the shaft is connected with the fourteenth level, which is designed to become the working level, replacing the twelfth in that respect as soon as the ores above the latter have been removed, which will be in the course of the next few years. The Ludington promises to be a very important factor in the future production of the mine. The lenses pitch westward rapidly from the Chapin mine proper, and their continuation is followed across the line formerly dividing the Chapin and Ludington. The workings at the Chapin at a depth of 900 feet find similar geological level at a depth of about 1,100 feet in the new shaft, at the present west end of the Ludington branch, and drifts connecting the two portions of the mine show the same excellent ore.

Developed in the very heart of the city of Iron Mountain, the Chapin mine is the mainstay of the community. With the Chapin proper, it comprises the Ludington and Hamilton, opened at separate properties but subsequently absorbed by their greater neighbor and now long operated as component parts of it. It has shipped, this season's production excluded, a total of 13,404,416 tons of ore, of which 902,650 were forwarded in 1905. No other single property in the Lake Superior region has produced as much ore as this, although the Norrie group, on the Gogebic, leads it by a quarter of a million tons. The Chapin was discovered in 1878, on lands owned by Henry Chapin, of Niles, Mich., and made its first shipment in 1880. A few years prior to that time, Mr. Chapin finding himself in financial straits, tried to trade the land in part payment of a debt of a few hundred dollars, but the creditor refused the offer, and Chapin was forced to

keep the property because he could not sell it. The land was not considered worth the taxes assessed against it, yet within the next decade or two, subsequent to the discovery of its mineral wealth, it had made the Niles man a millionaire several times over.

Long the Largest Mine.

For many years the Chapin deposit was the largest developed ore body in the world, holding this distinction until outstripped by the immense flat beds later opened on the Mesabi range, in Minnesota. It still contains an enormous tonnage, and has an indefinitely long life ahead. The ore bodies consist of a series of parallel lenses extending easterly and westerly for 6,100 feet in length. Excepting for the new "C Ludington," the greatest depth reached is in the Hamilton shaft, 1,420 feet. B Ludington is 1,320 feet down, and B Chapin 1,030. Two of these shafts have two compartments each, and the other has three. B Chapin is 8 x 16 feet in dimensions, B Ludington 7 x 18 and the Hamilton 7 x 21. Shafts and levels are connected at numerous points, making of the workings a veritable network, through which the air freely circulates. The product is won by the caving system, making the mine secure against accidents and permitting the removal of practically all the ore as the work proceeds. Comparatively little mining has yet been done below the 1,000-foot point, although the fourteenth level, in course of development the past two years from B Ludington shaft, is ready to supersede the present working level.

The Hamilton shaft which is used exclusively for hoisting ore, is as fine a shaft as was ever sunk in the region, and it is equipped with one of the very few flat cable hoisting plants in commission in the Lake Superior fields. There are two engines, 24 by 48 inches, operating two drums over which the steel cable is reeled. The wire rope is seven inches broad when new, but draws down to a width of four or five inches, half an inch thick, in service. The plant has given great satisfaction, working with a high degree of efficiency and economy. Kimberley skips, operating in balance and each lifting up to five tons at a load, are used, and with them a record of better than 2,500 tons has been established for a shift of 10 hours. In one month, not long ago, there were hoisted from this shaft nearly 100,000 tons of ore. The underground tramming is done by an electric haulage system. Twelve cars are considered a load for a motor, but at times as many as fifteen are handled. The trams dump into pockets at the shaft, and from these the ore is dumped directly into the skips. Each pocket holds just a skipload and is equipped with an apron, manipulated by a wheel. A twist of the wheel, the pocket is emptied, the skip is filled and away to surface the load goes like a rocket.

Surface is Sinking.

Because of the caving system of mining, which some years ago replaced the old plan of permanent openings, the surface at the Chapin is steadily sinking. The pit has now attained a length approaching a mile, and is nearly 1,000 feet wide at the surface, with a depth of between 100 and 200 feet. It is bridged by means of fills constantly built up to compensate for the gradual settling. The largest of these fills is that which supports the county highway and the railroad tracks crossing the company's lands. This is 600 feet long and of a width to permit of the highway and a double railway track. A gravel train is kept busy on the railroad right of way during the summer months, while teams are constantly drawing earth to protect the roadway. The Chapin is mining vigorously at depth, and with the immense amount of ore still to be taken out the filling is a work that must be continued indefinitely. To the east and west of this great fill a great depression plainly marks the course of the principal underground operations.

Located in the Hamilton shaft is the celebrated Allis-Riedler pump, one of the largest in use in any mine on the globe. This plant handles 2,000 gallons of water a minute, a feat which would be of little moment for a moderate elevation, but which becomes notable when it is considered that every gallon of this water must be lifted a quarter of a mile. The big engine is protected by a steel shell. The pump chamber was excavated in solid rock, but as it was in limestone the wall cracked in several places, and to protect the pump, whose uninterrupted operation is vital, and to guard against damage which might be caused by the fall of even a small amount of rock from the roof, a steel chamber, 34 feet wide, 60 feet in length and 22 feet in height, was provided.

The Chapin is capable of a production of a million tons per annum, although not quite that amount is maintained. The ore is a fine blue specular, and is mined in two grades, one 59 per cent iron and 0.065 per cent phosphorus, and the Ajax, assaying 53 per cent iron and 0.063 per cent phosphorus. The ore was extremely popular with furnacemen before withdrawn from market with the advent of the Steel Corporation. A force of about a thousand men is employed, and fifty machine drills are operated. Pumping costs, in themselves, are necessarily heavy, but are more than offset by the cheap power furnished by the company's hydraulic plant at Quinnesec falls, on the Menominee river, three and one-half miles south of the mine. Steam is employed to some extent, but the greater part of the power used is compressed air generated at the falls and forced to the mine through a three-foot steel main.

Big sums of money have been spent at the Chapin in the natural course of development, and the mine is in excellent physical condition and is economically operated. Order and system prevail everywhere, and the conduct of each department is perfection itself. Otto C. Davidson is in charge as general superintendent of the Steel Corporation's Menominee and Gogebic range mines; Martin Goldsworthy is the mining captain, and S. J. James is the mining engineer.

PUMP FOR HOBARD MINE.

As mentioned in THE IRON TRADE REVIEW recently, the Rhodes Mining Co. is about to install pumps to take care of the immense amount of water at the Hobard and Nassau mines. It has just placed an order with Fairbanks, Morse & Co. for a 3,000-gallon pump for the Hobard, which will be the largest pump on the Mesabi range, and a 1,600-gallon pump for the Nassau. The Hobard has been recognized as one of the worst water propositions on the range.

The 3,000-gallon pump is to have a triple-expansion steam end with cylinders 18, 29 and 46 inches in diameter by 36-inch stroke. The water plungers are to be 16 inches in diameter.

The 1,600-gallon pump is to be a compound condensing engine with 15 and 24-inch steam cylinders. The stroke is to 18 inches and the water plunger 14 inches in diameter. The pumps will have O. C. P. water ends. The smaller one is to be delivered in 60 days, the larger one in 90 days. The lift at the Hobard will be 400 feet and 300 feet at the Nassau.

Fairbanks, Morse & Co. will also install an electric light plant at the Nassau for both surface and underground lighting.

The work of the new pumps will be watched with interest as the success of the mines rests upon the handling of the water.

History and Methods of the Soudan Mine.

Office of THE IRON TRADE REVIEW.
Duluth, September 22.

About the old Minnesota mine now called the Soudan is woven some of the most interesting mining history of Minnesota. Not only is the mine interesting from the standpoint of history, but as it stands today it is unique among the Minnesota mines in many respects. The No. 8 shaft which has survived as the active shaft is sunk in a ridge, the Soudan hill, which averages 1,550 feet above sea level or 948 feet above Lake Superior. The mine presents the characteristics of the Gogebic range in that its ore is the hardest in the world and in the method of mining, the method of back-stoping. No other mine on the Mesabi or Vermillion range is a hard ore mine, though a percentage of the ores of the Ely trough are hard, and nowhere else on either of the above ranges is the back-stoping system used.

The earliest search for iron on the Vermillion and in Minnesota was in the neighborhood of Tower and Soudan and was probably undertaken by Amos Hall, A. C. Ely, E. H. Johnson and Henry Mayhew in 1861. They made their way to Vermillion lake in canoes by way of the St. Louis river, but nothing resulted from their exploration until the report by State Geologist Eames that gold had been found brought about the gold fever of 1865 and 1866. In that year, 1866, Geo. R. Stuntz discovered iron in that locality, but though he returned again in 1868 with J. B. Culver and did further exploring, nothing could be done, it was thought, because of the lack of railroad facilities and the great difficulties attendant upon obtaining them. On Dec. 21, 1874, the present Duluth & Iron Range railroad was chartered, the capital having been furnished by Charlemagne Tower. The road was first started from Two Harbors and a year or so later was extended to Duluth. By December of 1886, 96.3 miles to Tower had been completed and Oct. 1, 1888, saw the completion of the line from Tower to Ely, 21 miles. In the meantime the Minnesota Iron Co. had been incorporated on Nov. 14, 1882, by Charlemagne Tower and others, and the railroad was taken over as an auxiliary company. As early as Aug. 21, 1884, iron was shipped by rail from the Minnesota mine to Two Harbors.

From 1886 to 1890, there were as many as thirteen shafts operated and 1,800 men were employed at one time. Now ore is being taken out of No. 8 shaft alone and there are only 300 men on the payroll though there is work for nearly double that number. The old workings are picturesquely apparent, showing the locations of the old shafts and the pits from which considerable ore was taken without any underground work. The thirteen shafts were named Stuntz, Stone, Ely, East Tower (new), East Tower (old), West Tower, North Lee, South Lee, Breitung (new), Breitung (old) and Breitung. No. 7 shaft is being used as a timber shaft at present.

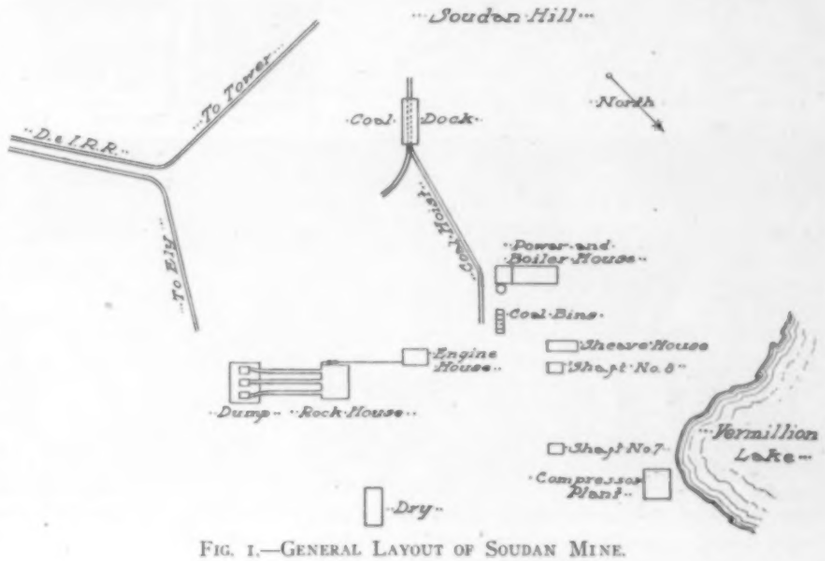


FIG. 1.—GENERAL LAYOUT OF SOUDAN MINE.

The ore bodies that are being worked are in two deposits. The No. 8 vein at the foot of the shaft and the Montana deposit 800 feet northwest of it. The ore veins on the Soudan hill occur for the most part as pitching synclines, the footwall of the Montana deposit, indicating the lay of the vein, rising at an angle of 74 degrees. The top level of the workings is No. 9 and the bottom one No. 13, the tramming being done on No. 12. Between these levels, when Capt. J. Pengilly had charge of the mine, it was attempted to drift a system of sublevels and slice out the ore. The plan may have worked well enough, but considering the extreme hardness of the ore it hardly seemed feasible. At any rate, whatever the success of the attempt, the more expensive system of back-stoping was returned to with the advent of Supt. Paul F. Chamberlain and continued under the general superintendency of Capt. Trezona. Unfortunately the disadvantages of the subs did not all disappear with the abandonment of the method but to have them every few feet interferes with the development of the stopes and is proving awkward.

The system of operating and the condition of the mine does not present any features unusual in mines worked in this manner except perhaps on the eleventh level where one stope of unusual size is being mined. Between the tenth and eleventh levels the vein is being opened in the middle and a stope will be worked off in both directions toward each end.

The ore is a slaty gray in color and in general appearance looks much like some of the hard accompanying rock, but has an unusual weight because of its high iron content. Vermillion lump, or, as it is more commonly called now, Soudan lump, runs nearly 67 or 68 per cent in iron and a piece of that ore has been known to have a specific gravity of 5.5. The phosphorus content of this ore is also high, running up to 0.094 per cent and the principal use of the ore is therefore in connection with open-hearth furnace practice. The method of handling the ore is very similar to that required for the ores of the lower ranges and for copper ores. The ore is hauled from the shaft in small cars to a rock house in which there are three crushers. The cars run on to a trip-up and the ore is dumped into a chute over a set of grizzlies, one chute for each crusher, down through the crusher and into cars similar to those above. A runway platform has been

built out over the side of the hill which permits of these cars being run out and on to other trip-ups, dumping the ore down through hoppers into the cars. The same platform served as a runway for dumping on the stock pile last winter. For a time during the winter the two grades of ore, Red Lake and Soudan Lump, were separated, but now everything is being shipped as lump. 148,000 tons were stocked and more than half of the stock pile has been shipped with a steam shovel working at it now.

Below the thirteenth level No. 8 shaft is in solid rock 200 feet, one of the enclosing walls of the No. 8 deposit, but the shaft is being sunk through this to reach other deposits which are below the present one. When that distance has been opened up, the bottom of the shaft will be at a vertical depth of 1,200 feet, the shaft being inclined. This will then be the deepest shaft in Minnesota. The most remarkable feature in connection with the Minnesota mine, however, is the length of time some of its men have been there. The underground captain, Andrew Larson, and several of the surface foremen and employes have been there since the opening of the mine twenty-three years ago.

The surface equipment of the mine covers considerable ground and includes a power house and boiler house for the shaft hoists, rock house and engine room, repair shops, warehouse and a

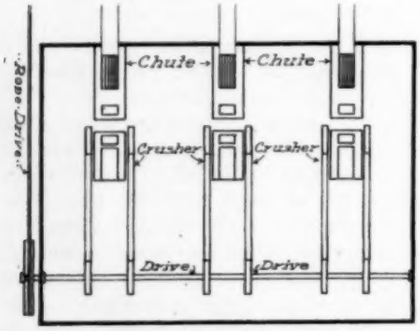


FIG. 2.—PLAN OF ROCK HOUSE, SOUDAN MINE.

large dry. The dry is worth especial mention, not only because of its size, but in connection with the style of lockers being adopted by the Oliver Iron Mining Co. They are of the expanded metal type and a great improvement on some of the other forms that are being used. The main hoists are twin Webster, Camp & Lane 22-inch by 48-inch engines with 10-foot drums. There are four drums arranged as shown in the accompanying sketch, two marked "A" for No. 8 shaft and the others which are now idle for No. 7 shaft and all can be driven from pinions on the one centrally located common crank shaft. The engines run continuously, slow when the skip is being lowered, during which operation the drum is simply controlled by a friction brake, and fast again when the clutch is thrown in on the drums for raising the skip. There is a drum for each skip and an operator for each drum. The speed of the engines is controlled by simply throttling the steam in the main steam

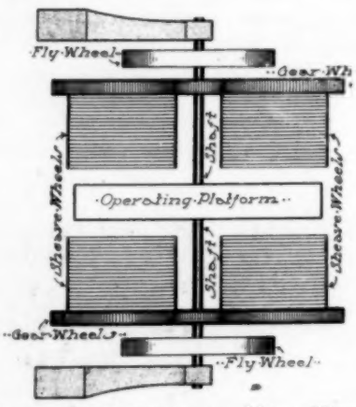


FIG. 3.—ARRANGEMENT OF MAIN HOIST, SOUDAN MINE.

pipe. Steam is supplied by three Webster, Camp & Lane return tubular boilers, 72 inch by 18 feet, 105 horsepower and a working pressure of 90 pounds. The Webster heating system is used with a Knowles feed pump.

The crushers in the rock house are of the standard type, one being built by S. E. Cleaves, of Houghton, Mich., and the other two by the Lake Shore Iron Works, of Marquette. The layout is shown in the accompanying sketch. The drive for the crushers is an 18 x 24 simple Allis Corliss engine. In the same engine room which adjoins the rock house is a small hoist for operating a cable railway for hauling coal from the coal dock below up the side of the hill to the power house and to storage bins on the top.

The compressor plant is a considerable distance from the shaft, on the edge of Vermillion lake, where water is easily available so that the compressors may be run condensing. The plant is installed in a brick building about 60 by 100 feet and air is compressed to 80 pounds and furnished down in the mine at 65 pounds. The compressors are duplex, cross compound Allis-Chalmers engines with steam cylinders 18 inches and 36-inches by 48-inch stroke, and two-stage air cylinders 30 x 48 x 48 inches. The air pumps for the condensers are belt driven from the crank shaft and are of the standard Allis type. Each compressor has two vertical coolers with a No. N Knowles circulation pump. Electric power is generated by a 90-ampere, 250-kilowatt Westinghouse generator, belt connected to a simple 10 x 14 Buckeye engine. Within the last two weeks a new cylinder has been put on this engine. Water is pumped to the top of the hill by a 5 x 6-inch triple-acting pump, built by William Baragwanath and a Knowles No. A. Steam is obtained from three upright boilers.

The Soudan mine will ship in the neighborhood of 225,000 tons this season.

Economy of System. — Were the national debt to be doubled the United States Steel Corporation would, were it to apply to the extinguishment of that debt all of the money that will be received for orders now on the steel corporation books, have sufficient funds to pay the debt and a good many millions left. It would be impossible for the steel corporation to accept these orders with a promise to deliver them as speedily as the customers desire had it not been for the harmonizing and perfect economy of system which has been established among the many plants, although that work cost in the neighborhood of forty millions and required three years' time. This system, this perfect harmonizing, simplifying and with the economy of distribution in view, changing the plants, represents the true spirit of co-operation. For, although these various plants are under the authority of the steel corporation, nevertheless they now work in co-operation, being no longer engaged in intense competition one with the other, which was an earlier characteristic of this business. So, too, the true spirit of co-operation has been almost unconsciously exemplified in the Hepburn rate law, so that hereafter there will be no excessive ruinous competition between railroads involving rebates and inequitable practices, but perfectly normal competition, which ends where corporation should begin.—"Holland," in Cincinnati *Enquirer*.

Given Loving Cup. — At the close of the banquet terminating the annual meeting of the American Boiler Manufacturers' Association at Pittsburg, last week, George N. Riley, of the National Tube Co., chairman of the local committee for the convention, was presented with a silver loving cup by David J. Champion, of the Champion Rivet Co., Cleveland, O., on behalf of the association.

CONVENTION OF THE AMERICAN BOILER MAKERS' ASSOCIATION IN PITTSBURG

As was announced in THE IRON TRADE REVIEW last week, the American Boiler Makers' Association met in convention at the Hotel Schenley, at Pittsburg. The first session was called to order on Tuesday and the association was welcomed by Mayor Guthrie. An abstract of Mayor Guthrie's address, together with the annual address of President Robert Munroe Jr. was given in THE IRON TRADE REVIEW last week. This address, together with a number of other speeches occupied the entire first session of the convention.

During the afternoon, a boat ride was held upon the Monongahela river, the party embarking on the steamer Island Queen and passing the various steel plants along the river banks, including the Oliver Iron & Steel Co., the National Tube Works, the Jones & Laughlin Steel Co., the Homestead Works, the Duquesne Steel Works, the Monongahela Steel Works, the open-hearth and armor plate works of the Carnegie Steel Co., the McClintic-Marshall Construction Co., the Edgar Thomson Steel Works, the United States Tin Plate Co., the Firth-Sterling Steel Co., etc. The return trip was made at night, and the different works along the river presented a totally different aspect than in the day time.

MEMBERS AND GUESTS AT THE AMERICAN BOILER MAKERS' ASSOCIATION CONVENTION.

The Wednesday morning session was begun by the appointing of the following committees: On time and place, nominations and auditing. The report of Secretary Farasay was read and approved by the auditing committee, there being a large balance in the treasury.

The next business brought before the association was the report of the committee on uniform boiler specifications. Col. E. D. Meier, chairman. This will appear in an early issue of THE IRON TRADE REVIEW. It rehearses the progress made during the year in conference with the American Association of Steel Manufacturers regarding standard specifications, as recommended by the American Boiler Makers' Association. While the former association is perfectly willing to uphold the action of its committee, in so far as the agreement with the boiler makers is concerned, it hesitates to make the agreement applicable to the general trade. Col. Meier detailed the results of a committee meeting of the American Association of Steel Manufacturers, in Washington, in conjunction with the Board of Supervising Inspectors, during which the subject of boiler materials was thoroughly discussed. Many of the points considered at this meeting were afterwards embodied in the rules of the Board of Supervising Inspectors.

In connection with the report of this committee, an informal talk was given by General George Uhler, inspector general of the Steamboat Inspection Service. He spoke of the possibilities of material—steel in particular—and urged that good steel can be manufactured under present specifications. Samples of materials were presented that were remarkable, both for their tensile strength and ductility. General Uhler considered American material and design superior, and the construction equal, if not superior, to that of foreign countries. The closing work of this session was the adoption of resolutions on the death of Mr. Samuel Berger, of Columbus, Ohio.

The Use of Vanadium in Steel.

At the Wednesday afternoon session, B. E. D. Stafford, general manager of the Flannery Bolt Co., Pittsburg, exhibited a number of steel sections, showing the results of the use of vanadium ore as an alloy for steel. Of the large number of samples exhibited by him, one was stated to show a tensile strength of 145,500 pounds per square inch with an elastic limit of 141,000 pounds per square inch. The torsional strength was 140,000 pounds per square inch with 1½ twists. The speaker stated that this sample was practically vanadium steel with a small proportion of nickel and 0.25 per cent vanadium. The elongation was 13.7 per cent and the reduction in area 24.7 per cent. W. L. Hirsch, of the American Steel & Wire Co., inquired how much the use of 0.25 per cent vanadium would increase the tensile strength of boiler steel of, say, 55,000 pounds tensile strength in boiler plate sections. Mr. Stafford replied that with the sample exhibited which would closely approximate with regular boiler plate steel, they obtained a tensile strength of 81,250 pounds per square inch, with an elastic limit of 58,200 pounds per square inch, and an elongation of 23.6 per cent and a reduction of area of 26 per cent. Mr. Hirsch replied that since as the hardness of steel increased the elongation decreased, he presumed that the tensile strength could be increased by the use of carbon, just as well as by vanadium. He wished to know whether, by the use of vanadium, the elongation would be retained while, at the same time, the tensile strength was increased. If not vanadium was of no value, because the steel would then be in the same condition as with the use of carbon. Mr. Stafford replied that all the tests proved that vanadium always has a tendency to increase the elastic limit and elongation, and it was this fact that makes it a vital steel in European practice.

Mr. Hirsch stated that it seemed to him that the proportion of elongation in the sample presented was such that it would not be recommended for boiler steel. It might give a high tensile

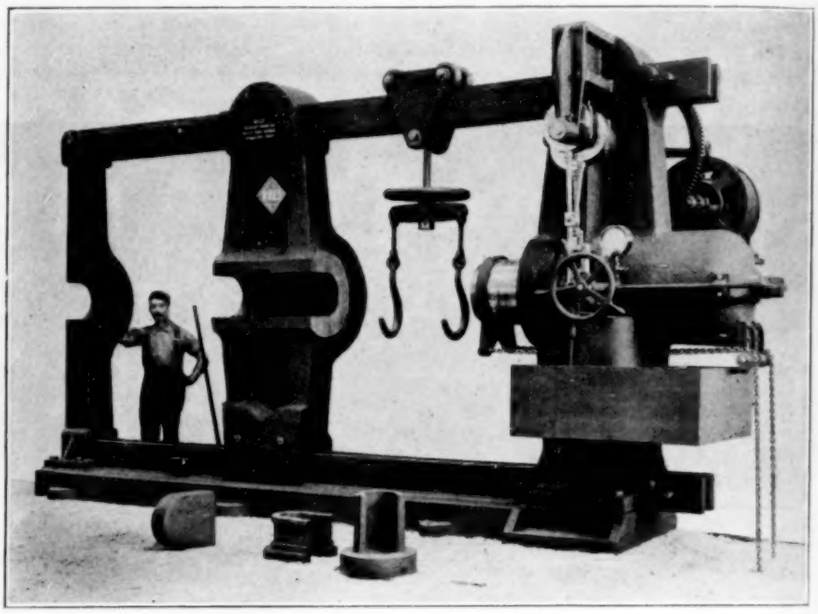
strength, but this could be obtained more cheaply. What is desired is elongation, elasticity and reduction of area, coupled with a high tensile strength. Mr. Hammond inquired of Mr. Hirsch whether he could make steel of the same tensile strength and elastic limit as above with carbon. Mr. Hirsch replied that steel could be made of about 65,000 or 70,000 pounds per square inch tensile strength and reaching, perhaps, 26 or 28 per cent elongation. The elastic limit of the steel, as a rule, being always about two-thirds of the tensile strength. General Uhler stated that as he understood it, from the samples and results of tests exhibited, and as explained by Mr. Stafford, the use of vanadium seems itself sacrificing ductility and tensile strength. At the suggestion of the chairman, further investigation and consideration of this topic was referred to the committee on uniform boiler specifications.

The report of the committee on time and place was then received, Atlanta, Ga., being selected as the place for the convention in 1907. The nominating committee then reported and the following officers were elected to serve during the ensuing year: President, M. F. Cole, Newnan, Ga.; secretary, J. D. Farasey, Cleveland; treasurer, Joseph F. Wangler, St. Louis; 1st vice president, John J. Main, Toronto; 2nd vice president J. Don Smith, Charleston, S. C.; 3rd vice president, William H. Fletcher, Hoboken, N. J.; 4th vice president, H. D. MacKinnon, Bay City, Mich; 5th vice president, H. Goldner, Philadelphia. Resolutions were then adopted conveying the thanks of the association to the various officials and residents of Pittsburg who contributed to the success of the meeting.

An executive session was held during the latter part of Wednesday afternoon and Wednesday evening, adjourning at a late hour. A short session was held Thursday morning, the balance of the day being devoted to entertainment. At the business session, a paper was read by H. J. Hartley, of the Wm. Cramp Ship & Engine Building Co., of Philadelphia, describing some boilers recently constructed under his supervision for the Southern Pacific Steamship Co.'s new vessels to be engaged in traffic between New York and New Orleans. These boilers are designed to carry a working pressure of 234 pounds per square inch. The shells of the boilers are composed of steel plate 1 11-16 inches thick, double butt strapped and riveted with 1½-inch diameter rivets throughout. At the conclusion of this paper the convention adjourned.

Entertainment Features.

The entertainment features were numerous and varied, and included automobile rides through the parks and luncheon at the Country Club on Wednesday, and a visit to Luna Park on Wednesday night. Thursday was devoted to a trolley ride and a visit to the plant of the H. J. Heinz Co., where the pary was the recipient of many courtesies and was under the special escort of Mr. Colder Gordon. An elaborate luncheon was served, after which a demonstration was given of the lowering and raising of the bear trap at Herr's Island dam, which is directly back of the main plant. The final entertainment was the annual banquet held at the Hotel Schenley, Thursday night. Col. E. D. Meier presided as toastmaster, and the following gentlemen responded: Hon. James Francis Burke, Gen. George Uhler, Walter M. McFarland, W. O. Duntley, J. D. Farasey and James Lappan.



NILES-BEMENT-POND CAR WHEEL PRESS.

90-INCH NILES, 600-TON HYDRAULIC WHEEL PRESS.

The increase in the use of wheels with steel tires has caused several changes to be made in railway repair shop equipment. Until very recently, hydraulic wheel presses of more than 400 tons capacity had not been known. Many shops have found difficulty in removing steel tired wheels from their axles, due to the great pressure caused by shrinkage on the tires after the usual pressure of 150 tons has been exerted to place the wheel center on the axle. In some instances it has been necessary to remove the tires or drill the hub to start the center.

Realizing the importance of a machine of such capacity as to eliminate these difficulties, the Niles-Bement-Pond Co., New York, has placed on the market a newly designed hydraulic wheel press of 600 tons capacity, which has already met with continued success.

The distance between the ram and the resistance post, which is a steel casting, is eight feet three inches. Four tension bars are used instead of two, and the post is so arranged that the weight is entirely removed from the tension bars. The cylinder, is of cast steel, and has an outside diameter of 27 inches. A three-plunger pump, driven by a 12½-horsepower motor, is on the side of the machine handy for the operator. The height between the tension bars is 90 inches and the machine will take wheels 84 inches in diameter on the tread.

The machine is mounted on a base plate, but no strains are transmitted to it, as all pressure is taken by the tension bars. The cylinder is bored true and lined with copper expanded into place and burnished. The piston is packed with best cup leather, is tight, durable and causes little friction. The ram is counterweighted for quick return when the release valve is open. The safety valve can be set to open at a desired pressure, and is protected from tampering by a lock box. The pressure gauge is graduated for tons of pressure and for pounds per square inch on the ram. The water tank is bolted under the cylinder, and takes the discharge and supplies the pump.

Several of these machines are now in use in one of the largest railway repair shops.

IMPROVED

IS BRITISH IRON AND STEEL TRADE OUTLOOK.

Prices Advance and Iron Stocks Decline.—Busy Autumn Prospects.

(Special Correspondence.)

Birmingham, Eng., Sept. 15.—In almost every particular, the trade outlook continues to improve, and everything points to a healthy condition. Pig iron is rising in price, warrants having gone up nearly 5s within the last fortnight. Conditions are now healthier than on the occasion of the advance some months ago, as the iron in store is steadily reducing, and in Midland brands there has been a rise of 5s to 7s 6d since the end of July. The significance of the statistics for August and the eight months of the year is enhanced, from the British point of view, by the fact that they compare with the period of improving trade of a year ago, yet still show a heavy margin to the good. The heat wave has passed, though we are still having glorious weather, and works which had to stop practically in a body have all resumed, with a prospect of a busy autumn. The Germans are still buying enormously, great shipments going from Northampton.

Welsh Steel Combine.

The Welsh steel combine is being a good deal discussed, the general opinion being that this step might profitably have been taken long ago. One of its early effects has been an increase in the price of galvanized holloware for which large quantities of steel sheets are used. The lead in this direction has been taken by Messrs. Roberts & Cooper, one of our largest firms, but it is expected that a general agreement to adopt the higher rates throughout the trade will be reached shortly. Several firms have had to cancel orders for wrought steel, owing to their inability to execute contracts. Prices are rising steadily, and further advances in the immediate future are likely. Galvanized iron sheets are about five shillings dearer than when I last wrote. Probably the next meeting of the Association in London will raise the minimum of £12 10s, which has now been passed, by at least five shillings.

There is no lack of evidence of the prosperity of iron-making companies. Moss Bay Iron & Steel Co made a net profit for the year just ended of £55,000, and paid a dividend of 5 per cent. Sir John Randles, presiding at the annual meeting, said the year was the best in the life of the company. Pearson & Knowles, Warrington, made a profit of £62,866, representing an increased earning of £5,700, the shareholders getting £6,100 more. Staveley Coal & Iron cleared £121,000, and paid a dividend, a few days ago, of 15 per cent. The firm is putting up large coke ovens and blast furnaces, which are not likely to be in complete operation before this time next year. The chairman, Chas. Markham, at the recent annual meeting, said they were full of work in every department and had a splendid year before them. The Pyle & Blaina works engaged in the manufacture of ferro-manganese and spiegel made £23,900, an increase of £9,800, and are able to distribute 12½ per cent.

Fear America and Germany.

The directors of Messrs. Guest, Keen & Nettlefold, Ltd., whose profit of £427,156 I have already referred to have been criticised because they insisted on adding to reserve £150,000, in addition to carrying forward £167,145. The reserve now amounts to £900,000 and the total investments £1,987,975 all outside securities. Some shareholders clamored for more dividend in addition to the 10 per cent paid. The answer of the chairman, Mr. Arthur Keen, at the recent meeting was significant.

The improvement in the iron and steel departments, he said, was due to increased value rather than increased demand, and the fact that "our foreign competitors, especially Germany and America, are very busy, and in consequence we, at present,, are able to compete more successfully and on better terms than we have been able to do for some time past. A short time after our last annual meeting, the chairman of a large steel company said England was a bad third. That is a statement which does not sound well, but I am not prepare to traverse it, and due appreciation of this fact is the most potent factor that governs the 'excessively cautious policy,' as it has been called, of the board." He added: "We desire to ensure that this undertaking shall be in a position to meet those periods of adversity which have always hitherto followed good times, without loss of dividend or capital value." Lord Bessborough was re-elected a director.

New Ship Orders Few.

The ship building yards continue very well off for work. The Armstrongs, for example, owing to heavy orders for armament, are busier than ever, and are adding to the number of their workmen. But new orders for ships are not flowing in at the recent rate. Among the most recently placed contracts is an order placed with Messrs. Furness, Withy & Co., Ltd., of West Hartlepool, by Messrs. Huddart, Parker & Co., of Melbourne, for a vessel specially designed for their coasting trade. Messrs. Irvine's Shipbuilding & Dry Docks Co., Ltd., also of West Hartlepool, have booked an order for two steamers for the Hessler Shipping Co., Ltd. All three steamers are to be engined by Messrs. Richardsons, Westgarth & Co., Ltd., Hartlepool.

Some idea of the boom in ship building is given by the most recent statistics of the Scotch trade. During August 41 vessels with a tonnage of 58,245 tons were launched from the Scotch yards, making for the year 279 vessels of 440,772 tons, being a gain of 73 vessels and of 105,746 tons as compared with last year. The Clyde increase for the year is expected to exceed 150,000 tons. The locomotive trade shows no falling off. Messrs. Stephensons, of Darlington, have work assured for many months ahead, and in Leeds several firms have twelve months' orders booked, of which a large proportion are for China and South America. The Cargo Fleet Co. has been equally successful in getting rail orders. This great Middlesboro firm has just entered into a contract to deliver rails for the Buenos Ayres & Grand Southern railway in the Argentine. The rails are to be of Cleveland steel, and are likely to keep the firm employed for three or four years.

Ebenezer Cooper Retires.

The retirement, which I mentioned lately as pending, of Ebenezer Cooper has now taken place, and the work people have presented him with an illustrated address and a silver loving cup as a memento. This took place at a luncheon to which the co-proprietor, C. W. Roberts, and Mrs. Roberts entertained 130 guests. Mr. Cooper is now 76 years of age and the various departments of his firm employ 2,000 men. Mr. C. W. Roberts said the future of the firm was not definitely settled, but probably it would be in a short time.

A very well known northern coalmaster, Alderman A. Curer Briggs, has died rather suddenly at the early age of 51. He was managing director of H. Briggs, Son & Co., Ltd., owners of the Whitworth Collieries, for ten years president of the Conciliation Board, and a member of the Royal Commission on Coal Supplies. Three years ago he was Lord Mayor of Leeds, and also held the position of chairman of the Mining Department of Leeds University.

The most recent wills proved include those of William Franklin, late manager of Messrs. John Brown & Co.'s armor plate mill at Sheffield, who left a fortune of £24,167; and Mr. Henry Pegg Chappell, late of the firm of Messrs. Bailey, Pegg & Co., engineers and iron founders of Brierley Hill. His fortune amounted to the comparatively modest sum of £11,318.

Money Situation Still Dominant Feature.

In a market dominated by the money situation, and with railroad developments furnishing the chief news features, trading during the past week was much contracted in volume. Price changes were erratic, though iron, steel and manufacturing stocks generally netted small advances, in several instances as the result of unusual activity. There was a heavy liquidating movement in the Steel issues, with closing quotations little changed, and American Locomotive advanced on brisk trading. The week saw the importation on one vessel of over $15,000,000 gold, the largest single shipment ever landed in this country, and other items raised the total engagements abroad since Sept. 10 to nearly $31,000,000, but the effect of this heavy inflow had been secured long before its arrival through the action of Secretary Shaw in permitting anticipated deposits. The call loan rate was kept within reasonable limits, but, strangely enough, time money was tight and commanded a higher rate. In the railroad world the factor of chief importance was the practical admission that Harriman interests were negotiating for the Baltimore & Ohio stock taken over by Kuhn, Loeb & Co. from the Pennsylvania. The New York Central announced an issue of nearly $30,000,000 new stock, Reading sold over 2,000,000 shares in the five full days, and Southern Pacific late in the week reached 97⅛, the highest price ever quoted. The industrial and commercial situation generally continues of undiminished strength. The new corn crop is out of danger from frost, cotton has safely escaped from the many dangers attending its growth, in iron and steel making there is no element of weakness, and the manufacturing concerns are few which will not carry over a handsome lot of unfilled orders into the new year.

Recent dividend declarations include the following: Tennessee Coal, Iron & Railroad Co., regular quarterly, 1 per cent on common and 2 per cent on preferred, payable Nov. 1; Cutting Car Co., regular quarterly, 1½ per cent, payable Oct. 1; New York Air Brake Co., regular quarterly, 2 per cent, payable Oct. 18; Westinghouse Electric & Mfg. Co., regular quarterly, 2½ per cent on preferred assenting and non-assenting stocks, payable Oct. 10.

The annual meeting of the Crucible Steel Co. will be held on October 17 at 10 a. m. in Jersey City, and the annual report will probably be given out around October 1, in accordance with a resolution passed last year to issue statements at least two weeks in advance of the annual meeting.

The Capital Lock-Nut & Washer Co., Columbus, O., is offering 300 shares of preferred stock, which has been held in the treasury, to present stockholders pro rata at par, with an equal amount of common stock. The increasing business of the company calls for a larger capitalization.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Sept. 15	Closing Quotation Sept. 22	Changes	Date of 1906 Ann. Meet.	Par Value	Capital Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div. Pay.
Allis-Chalmers Co	18¼	17	−1¼	Sept.	100	19,820,000	.....	.....	.....
Allis-Chalmers preferred	44⅜	40	−4⅜		100	16,150,000	7 cum	.....	Feb., 1904
American Can	7	7	.....	Apr. 24	100	41,233,300	.....	.....	.....
American Can preferred	60½	58	−2½		100	41,233,300	7 cum	5 Q.	Oct., 1906
American Car and Foundry	41¾	43⅜	+2	June 28	100	30,000,000	.....	.....	May, 1905
AmericanCar and Foundry preferred	100⅜	101	+ ⅜		100	30,000,000	7 n. c.	7 Q.	Oct., 1906
American Locomotive	74⅜	75	+ ⅛	Oct. 16	100	25,000,000	.....	1¾	Nov., 1906
American Locomotive preferred	112¼	114	+1¾		100	24,100,000	7 cum	7 Q.	Oct., 1906
American Shipbuilding	61½	60⅜	− ⅜	Oct. 2	100	7,600,000	4 n. c.	1 Q.	Aug. 1906
American Shipbuilding preferred	108	108	.....		100	7,900,000	7 n. c.	1¾ Q.	Aug. 1906
American Steel Foundries	11	11	.....	Oct. 3	100	17 700,000	.....	.....	.....
American Steel Foundries preferred	45¾	45½	− ⅜		100	17,700,000	6 cum	.....	Aug., 1905
Barney & Smith	71	74	+3	June 5	100	1,000,000	4	4	Sept., 1906
Barney & Smith preferred	140	140	.....		100	2,500,000	8 cum	8 Q.	Sept. 1906
Bethlehem Steel	23	25	+2	April 3	100	15,000,000	.....	.....	.....
Bethlehem Steel preferred	82¾	84	+1¼		100	15,000,000	7 n. c.	7 Q.	Aug ,1906
Bullock Electric preferred	112	112	.....	Oct. 2	100	1,000,000	6	6 Q.	July, 1906
Cambria Steel	38½	38	− ½	March 20	50	45,000,000	6	3 Q.	Aug., 1906
Cambria Iron	49½	49	− ½		50	8,468,000	4	4 S. A.	Oct., 1906
Colorado Fuel & Iron	56⅜	56⅜	+ ⅜	Oct. 15	100	30,132,000	7	.....	Apr., 1902
Wm. Cramp & Sons Ship & Eng. Bldg. Co.	15	18	+3	May 31	100	6,098,000	5	.....	Nov., 1902
Crucible Steel	123½	123½	− ½	Oct. 17	100	25,000,000	.....	.....	.....
Crucible Steel preferred	80½	78⅛	−2⅜		100	25,000,000	7 cum	.....	Sept., 1906
Empire Steel	6	5	−1	Feb. 28	100	2,281,400	.....	.....	.....
Empire Steel preferred	41	40	−1		100	2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	95	95	.....	Feb. 20	100	1,000,000	6	6 Q.	Aug., 1906
Fay & Egan preferred	128½	128½	.....		100	1,000,000	7 cum	7 Q.	Aug., 1906
General Electric	166	166¼	+ ¼	May 8	100	48,256,050	8	8 Q.	Oct., 1906
International Pump	48¼	48½	+ ¼	June 5	100	12,262,500		2	July, 1905
International Pump preferred	83	85	+2		100	8,850,000	6 cum	6 Q.	Aug., 1906
Lackawanna Steel	72	72	.....	March 14	100	34,971,400	.....	.....	.....
Lake Superior Corporation	18	17	−1	Oct. 3	100	40,000,000	.....	.....	.....
Niles-Bement-Pond	130	130	.....	Feb. 7	100	5,000,000	6	6 Q.	Sept, 1906
Niles-Bement-Pond preferred	105	105	.....		100	2,000,000	6 cum	6 Q.	Aug., 1906
Otis Elevator Co	50	50	.....	March 19	100	6,350,300		2 A.	Apr., 1906
Otis Elevator Co. preferred	98	96	−2		100	5,589,500	6 n. c.	6 Q.	Oct., 1906
Pittsburg Coal Co	15	15	.....	Feb. 12	100	30,135,000	.....	.....	.....
Pittsburg Coal preferred	55	55	.....		100	30,716,200	7	.....	Apr., 1905
Pressed Steel Car	54½	54½	+ ⅜	Feb. 21	100	12,500,000		3	Aug., 1904
Pressed Steel Car preferred	97¾	97¾	.....		100	12,500,000	7 n. c.	7 Q.	Aug., 1906
Pullman Palace Car	249¾	254	+4¼	Oct. 18	100	74,000,000		8 Q.	Aug., 1906
Railway Steel Spring	54½	57½	+3	March 1	100	13,500,000		4 S. A.	Oct., 1905
Railway Steel Spring preferred	101	103	+2		100	13,500,000	7 cum	7 Q.	Sept., 1906
Republic Iron & Steel	36¾	37¾	+1	Oct. 17	100	27,352,000	.....	.....	.....
Republic Iron & Steel preferred	102¾	99¼	−3½		100	20,852,000	7 cum	7 Q.	Oct., 1906
Sloss-Sheffield	78⅝	75	−3⅝	March 14	100	7,500,000	5	5	Oct., 1906
Sloss-Sheffield preferred	106	106	.....		100	6,700,000	7 n. c.	7 Q.	Oct , 1906
Tennessee Coal & Iron	160	159	−1	May 15	100	22,552,800		4 Q.	Nov., 1906
U. S. Cast Iron Pipe & Foundry	46¾	48	+1¼	June 27	100	12,500,000		2	Sept., 1906
U. S. Cast Iron Pipe & Foundry preferred	90	91½	+1½		100	12,500,000	7 n. c.	7	Sept., 1906
U. S. Steel	45⅞	45½	− ⅜	April 16	100	508,302,500	2 n. c	½ Q.	Oct., 1906
U. S. Steel preferred	106¾	106¾	+ ⅛		100	360,281,100	7 cum	7 Q.	Aug , 1906
U. S. Steel 5's	98¼	98⅛	− ⅛		100	463,798,000	5	5 A.	.....
Virginia Iron, Coal & Coke	50	52⅞	+2⅞	Sept. 18	100	8,641,600	.....	.....	.....
Westinghouse Electric	155	153	−2	June 27	50	20,996,350	10	10 Q.	Oct., 1906
Westinghouse Air Brake	166	170	+4	Oct. 2	50	10,990,450	30	30 Q.	Oct., 1906

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Clarksville Foundry & Machine Co., Clarksville, Tenn., has been incorporated with a capital stock of $25,000 by Graham MacFarlane, Guy R. Johnson, Q. C. Atkinson, E. T. Ancher and H. L. Leech.

The Zeman Iron Works Co., Cleveland, O., has increased its capital stock from $25,000 to $50,000.

The Troup Segmental Gear Wheel Co., Toledo, O., has been incorporated to manufacture a patent segmental gear wheel, the invention of E. L. Troup. The capital stock is $63,000, and the incorporators are: Charles E. Bennett, J. H. Miller, T. U. Franklin, J. Walter Bennett, I. P. Schofield, C. F. Franklin and E. L. Troup.

The Crouse-Tremain Car Construction Co., Cleveland, O., has increased its capital stock from $100,000 to $250,000.

The Continental Blow Pipe Co., Lexington, N. C., has been incorporated to manufacture dust collectors, furnace feeders and exhaust fans and to establish a complete blow pipe system. The capital stock is $50,000 and the incorporators are: W. H. Walker, John W. Crowell, J. R. McCrary, all of Lexington.

The El Paso Foundry & Machine Co., El Paso, Tex., has increased its capital stock from $200,000 to $300,000.

The Utah Karns Tunneling Machinery Co., Salt Lake City, Utah, has been organized with a capitalization of $300,000 by J. B. Belcher, J. H. Clive, W. E. Vigus, W. P. Cooper and W. H. Child.

The Indiana Rolling Mill Co. has been organized with a capitalization of $200,000 to erect and operate a large mill in Linton, Ind., for the manufacture of rails. Officers of the new company are: Job Freeman, president, Linton; J. W. Hamilton, vice president, Linton; Joe Moss, treasurer, Linton, and J. R. Finkelstein, secretary and general manager, Terre Haute.

The Nortmann-Duffke Foundry Co., Milwaukee, Wis., has increased its capital stock from $20,000 to $50,000.

The Long Arm System Co., Cleveland, O., has increased its capital stock from $340,000 to $400,000.

The Canaan Coal Co., Jackson, O., has increased its capital stock from $50,000 to $1,000,000. This is the company in which John E. Jones, of the Globe Iron Co., and L. V. Brown, of the Star Furnace Co., both of Jackson, are interested.

The Ohio Sand Milling Co., Jackson, O., has been incorporated with a capital stock of $10,000 by Fred E. Jones, Dan C. Jones, Eben Jones, John E. Jones and J. M. McGillvary.

The Hydraulic Pressed Steel Co., Cleveland, O., has been organized with a capitalization of $150,000 by James H. Foster, C. C. Wise, T. B. Graham, C. L. Lehr and A. Herzer.

The Parker Hoist & Machine Co. Chicago, Ill., has been incorporated with a capital of $15,000 by Adelbert E. Parker, Ingall Peterson and Frank H. Parker.

The Pleasanton Foundry & Machine Co., Pleasanton, Kan., has been organized with a capitalization of $10,000 to make gas and gasoline engines and do general repairing. The incorporators are: B. F. Blaker, Dr. Henry Plumb, T. J. Blakey, John A. Hall and R. C. Smith. The plant will be put in operation as soon as possible.

The Cleveland Iron & Steel Works Co., Cleveland, O., recently incorporated, has increased its capital stock from $10,000 to $400,000.

The Utica Engine Stop Co., chartered with a capital stock of $10,000, will manufacture engine stops, etc. The incorporators are: William I. Foley, Chester W. Davis and Harry M. Martyn, Utica, N. Y.

The Peterborough Steel Rolling Mills Co., Ltd., Peterborough, Ont., has been organized with a capitalization of $200,000 with William Ferguson, William Rudkins, Robert John Munro, Austin Dunn, Robert H. Fortye, Daniel O'Connell and Alex. Elliott, as provisional directors.

The E. K. Watson Co., Ltd., Montreal, Que., has been incorporated to manufacture machinery, implements, etc. The capital stock is $200,000 and the provisional directors are: James H. Parkes, Edwin K. Watson, W. H. Henderson, George A. Savage and Arthur R. Picard.

The North Side Iron Works has been incorporated to deal in iron and building work. The capital stock is $15,000 and the incorporators are: Ernst Kiefhaber, No. 2441 Crotona avenue; Frederick Horenburg, No. 1835 Carter avenue; Joseph Balaban, No. 2049 Ryer avenue, and Samuel J. Liebman, No. 1 West 112th street, all of New York.

Leffler, Thiele & Co. has been incorporated with a capital stock of $150,000 to manufacture enameled steel ware, etc. The incorporators are Francis Leffler, Albert H. Thiele, Francis H. Rohe, and Walter J. Fenstever, No. 147 Murray street, New York.

The Central Fairmont Coal Co., Clarksburg, W. Va., has been incorporated with a capital stock of $50,000 by William Moore, John Horner Davis, E. B. Templeman and O. E. Swartz.

The Bland Iron & Steel Co., Wytheville, Va., has been organized with a capitalization of $50,000 by Sampel W. Williams and Samuel W. Williams Jr., of Wytheville; Arthur R. Porterfield and Fulton Kegley, of Bland.

The concern of W. E. Messeger & Co. has been organized at Pittsburg, Pa., to act as agents for manufacturers in the sale of specialties for steam, gas and water work, and will open offices in the Conetoga building in that city.

The Choctaw Coal & Coke Co., Bokoshe, I. T., has been organized with a capitalization of $50,000 by I. R. Packard, Edwin Henderson and A. J. Foster.

The Standard Furnace & Range Co., Louisville, Ky., has been organized with a capitalization of $70,000 by Louis L. Rubel, I. W. Bernheim, Bernard Bernheim, George Ogle and L. G. Gutermuth.

The Ivanhoe Furnace Corporation, Ivanhoe, Va., has been incorporated to operate an iron furnace. The capital stock is $100,000 and the incorporators are: George T. Lewis, J. B. Armstrong, and J. R. D. Huston, all of Pittsburg, Pa.

New Construction:

The Trussed Concrete Steel Co., which recently secured a large tract of land near Youngstown, O., is shortly to begin work on an extensive plant for the manufacture of steel truss work for buildings, bridges and other cement work. About 250 men will be employed at the start.

The Goldschmidt Thermit Co. is about to vacate its present manufacturing premises at 179 Christopher street, New York, having bought ground at the corner of Cornelison and Bishop streets, Jersey City, N. J., and erected thereon a factory building 75 x 165 feet within easy reach of its down-town offices. The new plant will be occupied about Oct. 1.

The Owen Machine Tool Co., Springfield, O., is planning further extensions of its plant, and is now in the market for six 16-inch lathes, one 24-inch drill and one hardening furnace.

The Wood Shovel & Tool Co., Piqua, O., has begun the construction of a reinforced concrete store house 60 x 100 feet. Considerable new equipment will be installed, which will increase its output about one-fourth.

The Fayette Coke Co. has let the contract for the erection of 50 new coke ovens at its Shamrock plant, New Salem, Pa.

The Piqua Foundry & Machine Co., Piqua, O., manufacturing the Piqua positive foundry blower, is planning extensive improvements tripling its present capacity, and will require considerable new equipment.

The Hiett Plow Co., Dryden, Ark., is building a plant for the manufacture of a patent plow and other farming implements.

The Dayton Pneumatic Tool Co., Dayton, O., has recently installed a large amount of new machinery and equipment, giving it an increased capacity of 50 per cent and enabling it to make earlier deliveries. Further extensions are planned.

The Columbus Bolt Works, Columbus, O., reports that the new building which it is now erecting is to be used as a warehouse. It will be 60 x 90 feet, five stories in height, of reinforced concrete construction, each floor calculated to carry a load of 2,000 pounds per square foot. The local building inspector states that this will be the strongest building in Ohio—that is, it will carry a heavier load per square foot of floor space than any other. It will be located to ship from the first floor by the Hocking Valley railroad and from the second by the Pennsylvania lines, and will be completely equipped with elevated devices for assembling in car loads.

The American Drawn Steel Co., corner Eighth and Willow streets, Philadelphia, has prepared plans for a large two-story warehouse.

The Oscar Barnett Foundry Co., Newark, N. J., is to erect a new plant consisting of a machine shop 40 x 135 feet, shipping room 50 x 150 feet, light foundry 100 x 150 feet, heavy foundry 100 x 150 feet, carpenter and pattern shop, buffing and sorting room, japanning room and storage room. All the buildings will be of brick and steel construction from plans prepared by Thomas H. Hannah, of Pittsburg.

The Seymour Mfg. Co., Ansonia, Conn., is adding a large building to its plant to be used as a rolling mill.

The Hance Casting Co., formerly of Columbus, O., has its new foundry at Plain City, O., in full operation, doubling its former capacity for custom foundry work, gray iron and semi-steel castings.

The R. J. Schwab Sons Co., Milwaukee, Wis., has let the contract for a five-story reinforced concrete machine shop 50 x 90 feet. A power plant is also to be added.

The General Fireproofing Co., Youngstown, O., reports that the equipment for additions now under way will be largely special and of its own construction.

The Root & Van Dervoort Engineering Co., Moline, Ill., has increased its capital stock from $125,000 to $250,000. It is shortly to erect a new machine shop 90 x 400 feet, of brick construction, a testing and painting building 40 x 140 feet and an office building 41 x 70 feet. The present main building of the company is to be vacated and a central heating and power plant to supply the entire system of buildings operated by this company and the Moline Automobile Co. will be erected.

The Reading Iron Co. is erecting a stand pipe 75 feet high and 25 feet in diameter at Reading, Pa.

The Piqua Flour Co., Piqua, O., has purchased a tract of land 115 x 310 feet on which it expects to build a plant which will give it a capacity of 10,000 barrels of core flour monthly.

The Connellsville Central Coal & Coke Co. has begun the construction of a 200-oven coke plant in Menallen township, Fayette county, Pa. John Ball, of Uniontown, Pa., is in charge of the work.

The Susquehanna Hardware Mfg. Co., Buffalo, N. Y., recently organized for the manufacture of light and medium lines of hardware, has contracted for the erection of its factory at Susquehanna, Pa.

The Kellogg Iron Works, Buffalo, N. Y., has moved into its new plant at the junction of the Buffalo, Rochester & Pittsburg and Buffalo Southern railroads.

The Kenton Hardware Mfg. Co., Kenton, O., is contemplating making improvements in the very near future which will include the erection of a one-story brick foundry building. The company will require a 66-inch cupola and a belt or rope driven elevator in addition to the transmission system.

The Clyde Iron Works, Duluth, Minn., has purchased a tract of land on which it will erect one of the largest foundries and machine shops in the northwest.

General Industrial Notes:—

The Southern Steel Co. on Oct. 1 will occupy its new general offices for which it has leased almost the entire twelfth floor of the Brown-Marx building, Birmingham, Ala.

The borough of Cokeburg, Pa., where two mines of the Ellsworth Coal Co. are located, has been incorporated.

The D. T. Williams Valve Co., Cincinnati, O., has purchased the large warehouse of the Kroger Grocery & Baking Co. on Hunt street, in that city.

The Pennsylvania Coal & Coke Co., Philadelphia, Pa., announces its retirement from the active coal business, having leased its mines and other properties to the Pennsylvania, Beech Creek & Eastern Coal Co. The president of this company is James Kerr, Whitehall building, 17 Battery place, New York, and the general sales agent is Robert Mitchell, Land Title building, Philadelphia, where the office of the Pennsylvania Coal & Coke Co. will also be continued.

Consular advices are that during the first half of the year German coal mines failed to produce enough to meet the demand.

At the recent annual meeting of National Steel & Wire Co. stockholders the retiring board of directors was re-elected.

The German iron and steel industry, according to official reports, is enjoying record prosperity. Many new furnaces and rolling mills are under construction. The pig iron production during July was 1,041,447 tons.

The Austrian government reports its 1905 production of iron ore at 1,913,781 tons, of iron pyrites at 8,407 tons and of manganese ore at 13,788. Its forge pig iron output was 947,034 tons and foundry iron 172,578 tons.

Fires:—

No 3 blast furnace of the Illinois Steel Co. blew out Sept. 13 causing considerable damage to its stack and making relining necessary. No one was injured.

The Cleveland Hardware Co., Cleveland, O., sustained a loss of about $5,000 by fire originating in its engine room Sept. 21.

The Jeffrey Mfg. Co., Columbus, O., suffered a $1,500 loss Sept. 21 by fire originating in the new chain department from an overheated gas furnace.

The Lanyon Smelting Works, at Iola, Kan., were burned last week with a loss approximating $75,000. Their destruction has caused quite a shortage in the output of spelter, which has gone up 25 cents.